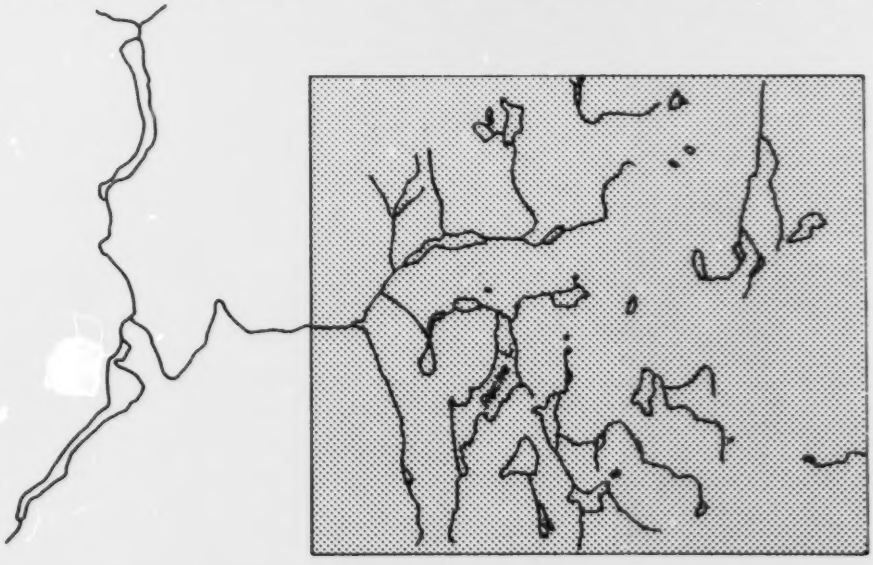
Province of
British Columbia

Ministry of Lands,
Parks and Housing

Honourable Anthony J. Brummet, Minister

ROCHE - McGLASHAN
CROWN LAND PLANNING REPORT



ROCHE-MCGLASHAN AREA

SUB-DISTRICT CROWN LAND PLANNING REPORT

prepared by

Ministry of Lands, Parks and Housing
Lands and Housing Regional Operations Division
Thompson-Okanagan Region, Kamloops, B.C.
October, 1982

Province of British Columbia

Ministry of Lands, Parks and Housing

File: 3401035

82-11-05

Mr. T.E. Lee
Assistant Deputy Minister
Lands and Housing Regional Operations
1019 Wharf Street, 6th Floor
Victoria, B.C. V8W 2Y9

Re: Deferred Area Planning - Roche-McGlashan Area

This is to convey ten (10) copies of the completed Crown Land Planning Report for the above-noted area. I am forwarding it both for your information, and recognizing that there are implications for other divisions of this Ministry and for the Ministry of Forests. The report and its recommendations are a product of co-operative input and review by several agencies, rather than the work of any single Ministry. I trust that the broad base of responsibilities represented by participating resource Ministries, local government, and public groups will allay any concerns which might be encountered as the document proceeds through the Executive offices.

For purposes of ongoing Crown land administration by Thompson-Okanagan Region Lands and Housing Regional Operations, I have endorsed the report's recommendations. The report received endorsation by the Thompson-Okanagan Regional Resource Management Committee on October 26, 1982. There was no dissention in the expression of consensus support by R.M.C. agencies. It was noted that the recommendations constitute a package in which every part, e.g. limited timber harvest, is considered essential. It was also noted that there will be significant opportunities in operational planning subsequent to creation of a Provincial Recreation Area, to recognize an expanding role for private industry in recreation management.

D.G. Podmore
Regional Director

Province of
British Columbia

Ministry of
Agriculture

DISTRICT OFFICE

Telephone 374-3614

162 Oriole Road
Kamloops, B. C.
V2C 4N7

November 1, 1982

Mr. D. G. Podmore
Regional Manager
Lands Parks & Housing
348 Tranquille Road
Kamloops, B. C.
V2B 3G4

Dear Mr. Podmore:

This confirms the approval of the Roche-McGlashan Sub District Crown Land Plan by the Thompson-Okanagan R.R.M.C. at the October 26, 1982 meeting.

Yours truly,

A.N. Isfeld, P.Ag.
Vice Chairman
Thompson-Okanagan
R.R.M.C.

ANI/pl
cc: Mr. B.E. Marr
Chairman L.U.T.C.

Mr. A.B. Campbell
Chairman R.R.M.C.

MINISTRY OF LANDS,
PARKS AND HOUSING
NOV 02 1982
REGIONAL DIRECTOR
KAMLOOPS, B.C.

File: 3401035

82-10-27

Mr. D.G. Podmore
Regional Director
Thompson-Okanagan Region
Lands and Housing Regional Operations
348 Tranquille Road
Kamloops, B.C. V2B 3G6

Dear Sir:

Re: Crown Land Planning: Roche-McGlashan Area

This is to convey the report and recommendations of the planning team constituted for the Roche-McGlashan Deferred Area. After carefully considering ministry policy requirements for Crown land planning, the Crown land issues requiring resolution, and all relevant information on those issues, the team has completed a planning report at the sub-district level of analysis.

The rationale for the planning report approach, the inventory, and the discussion and analysis accompany the team's recommendation that the upper Bleeker Creek watershed within the study area be designated under the Park Act as a new Provincial Recreation Area. The remainder - approximately half of the study area - should be managed under Provincial Forest administration.

Conditions are attached to clearly define the intent of the recommended Recreation Area, emphasizing control of public use and delegation of resource responsibilities to maintain and enhance current multiple-use values. The implementation of this recommendation will require that some lands be removed from the existing Monte Hills Provincial Forest, but no current timber harvesting licences are involved.

I trust that you will be able to endorse the team's findings for conveying to R.M.C., and subsequently to the ministry executive.

Yours truly,

D.L. Zirul
Regional Planner

DLZ/dt

FOREWORD

ROCHE-MCGLASHAN CROWN LAND PLANNING REPORT

Crown land use and management is a contentious issue in the Kamloops area. The effect of jurisdictional complexities and escalating land/resource demands is being felt everywhere in British Columbia, but in the Kamloops area there is a particularly intense situation. This appears due to a combination of natural resources, the growing urban population, and the relative ease of access to and from the major centers on the coast. High recreational resource values are attracting large numbers of people to a cluster of lakes just south of Kamloops: the Roche-McGlashan area. Conflicts among recreation interests, and between recreation, timber, forage, water and other concerns have been mounting. The atmosphere has generally been one whereby each land/resource agency has pursued its own policies, programs and plans, and no common goal has existed for the area as a whole. Crown land allocation in this situation has generally been in a reactive decision mode rather than one of designation as a result of planning.

This report documents the process of creating a planning framework for Crown land administration and management in the Roche-McGlashan area. The first step in this process consists of developing general goals and objectives, assembling background information, and conducting a preliminary analysis to identify the range of conceptual land allocation patterns which addresses Crown land use and management needs. This was prepared with the assistance and participation of a planning task force, made up of representatives of local and provincial government agencies, industry groups, and members of public interest organizations. A preferred concept is then identified on the basis of a more detailed analysis by the planning task force members. That concept forms the basis for preparation of a land designation map and detailed policy guidelines for operational planning and administration. These recommendations are tendered with this document to complete a Sub-District Crown Land Planning Report for the Roche-McGlashan area.

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PREFACE

CROWN LAND PLANNING

Crown land planning is a process whereby the demands on and the resources in the land are placed into a visible and logical framework for decisions on how this public resource ought to be used. Decisions may then be rendered which are directly relevant to defensible social, economic and environmental criteria and to the limits of what is feasible in terms of current mandates, manpower and fiscal resources.

The Ministry of Lands, Parks and Housing has established a Crown land planning program which identifies several levels of analysis. This provides an orderly and systematic progression of decision-making from policy generation to highly specific land development (operational) plans. A Sub-District planning level is where the question of suitable land use is first addressed in sufficient detail to consider specific areas for each of the basic opportunity categories, e.g. agriculture, recreation, settlement, forestry. A Sub-District Crown Land Plan or Planning Report identifies the most suitable Crown land uses in a given area, and it formulates programs and identifies responsibilities for subsequent management or development. Upon completion it is formally adopted by the Ministry, and its detailed land use prescriptions may be secured under legislation.

Crown land planning is distinct from and not to be confused with local government's planning/zoning programs for private land, or with the resource or development planning programs of other provincial Ministries. Crown land planning is similar in some respects to processes employed by other agencies, in that most identify inter-agency and user group participation as essential and may prescribe public involvement to give the process direction at critical stages. The principal differences relate to the application to the Crown land base itself, and the range of alternative uses which must be considered.

DEFERRED AREAS

Certain Crown lands in British Columbia have been identified for an accelerated planning program. This is a direct outcome of the Premier's January 6, 1981 directive that the conflicting policies of the Ministry of Lands, Parks and Housing and the Ministry of Forests be resolved through the Sub-District Crown Land Planning process.

In reaction to predicted shortages in timber supply, the government recently decided that the Crown lands of the province should generally be assigned a timber and forage production priority. This is occurring in all cases where there is not an already obvious commitment to settlement. Locations where there may be a need to respond to other demands have been identified, however, from records of land-use conflicts and petitions for new land use opportunities. These represent potential exclusions from Provincial Forest lands.

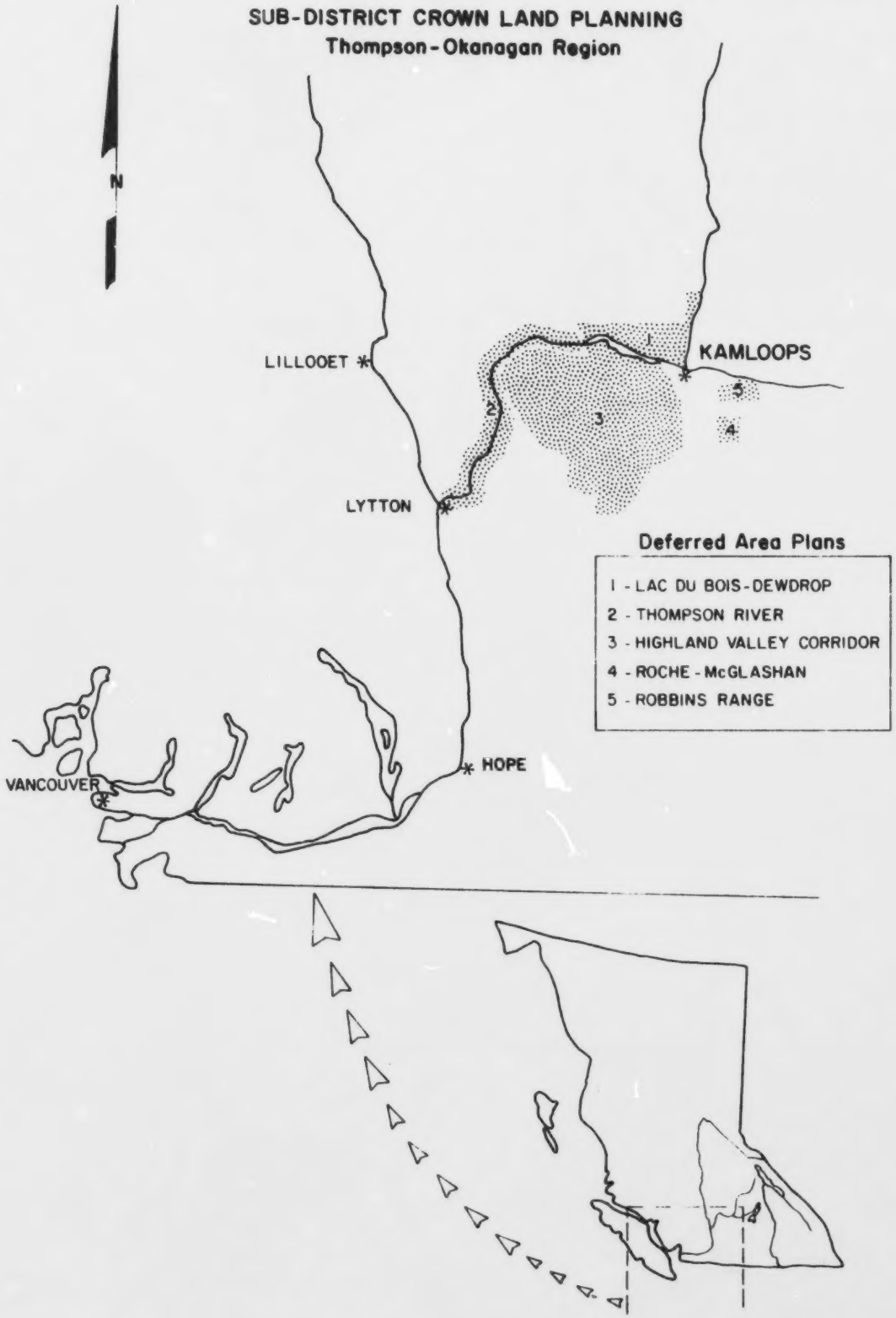
In order to determine the appropriate management emphasis for these contested lands, the Ministry of Forests and the Ministry of Lands, Parks and Housing have agreed that inclusion in the Provincial Forest and other decisions involving significant land commitments should be deferred until comprehensive Crown land plans or reports can be completed. These areas are termed Deferred Areas, and the analyses are being undertaken. The Sub-District planning process is summarized in Table 1, and the lands selected for planning under this program in the Thompson-Okanagan Region are indicated on Map 1a (following pages).

Table 1 SUB-DISTRICT CROWN LAND PLANNING PROCESS

STEP	RESULT
1) establishment of the planning task force	commitments to participate from government, industry, major landowners, organized groups
2) identification of the problems and issues to be addressed	clear statements of the positions of participants on land use demands and conflicts
3) derivation of goals and objectives	a statement of purpose agreed upon by task force members
4) data inventory	resource and land-use capability mapping; mapping of existing commitments
5) inventory review and supplementary inventory	interpretation of resource/social values
6) data analysis	land suitability considerations
7) formulation of conceptual land use alternatives	different approaches to Crown land management, involving various allocations of land/assignments of administrative authority to meet the objectives
8) government, industry and public review (optional)	including media coverage and public forum
9) selection of preferred alternative	preferred concept identified from analyses by task force members and the public
10) preparation of detailed land designations and policies	foundation for Crown land allocation, management and administration for "forest" and "non-forest" uses

Map 1a

SUB-DISTRICT CROWN LAND PLANNING
Thompson - Okanagan Region



PART 1.0 BACKGROUND TO THIS REPORT

The Roche-McGlashan Area (Map 1) is one of five Deferred Areas identified in the Thompson-Okanagan Resource Management Region. It is comprised of approximately 109 km^2 (42 square miles) of predominantly Crown-owned lands about 26 kilometers south-east of Kamloops, B.C. It has been traditionally used as timberland, as Crown range for cattle, and for recreation. It contains a dozen fish-bearing lakes on the same watershed, within a short distance of each other. Roche Lake - the largest - is internationally renowned for the sport fishing opportunities it offers. Road improvements made in the early 1970s, in response to public complaints about access conditions, put the area within 40 minutes drive of Kamloops. It is also within relatively easy reach of the major population centers of Vancouver and north-west Washington State.

Although no quantitative data are available for the study area, major increases in recreation pressure have been noted in the last ten years by the ranchers, timber interests and recreationists who use it regularly. There is also demand generally on the lakes in the B.C. Interior for more permanent occupation opportunities. In the study area, a commercial resort on Roche Lake has recently expanded and changed to a sharehold arrangement specifically tailored to meet the demand for cottage-sites. Responding directly to recreation demand with further or better facilities and/or cabin-site opportunities may be possible, but the demands from non-occupational uses are already resulting in serious user conflicts.

The public facilities on the lakes are minimal. Crowding of campers over the available open space virtually precludes day-use by local residents in some seasons. Roads in the area are virtually being destroyed by heavy recreation traffic in wet conditions. There are concerns that water quality may deteriorate given the already committed level of development. The fishery in Roche Lake is changing in response to increasing use, and improvements in the livestock and fish and wildlife interest-sectors recently made possible through coordinated resource planning may be endangered. A comprehensive solution is required.

ROCHE-McGLASHAN CROWN LAND PLAN

INVENTORY MAP *1 - BASE MAP

Topographic Detail ~1250~
(contour interval - 50 meters)

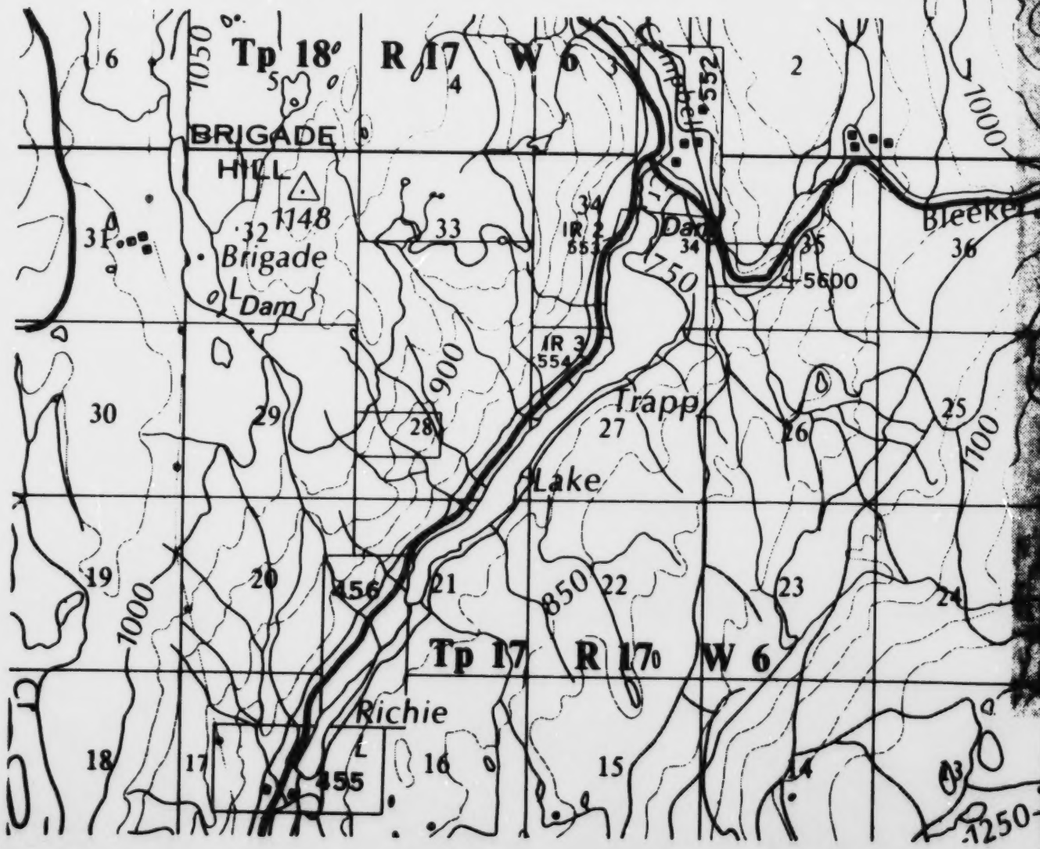
Drainage — Creeks, Lakes, Swamp

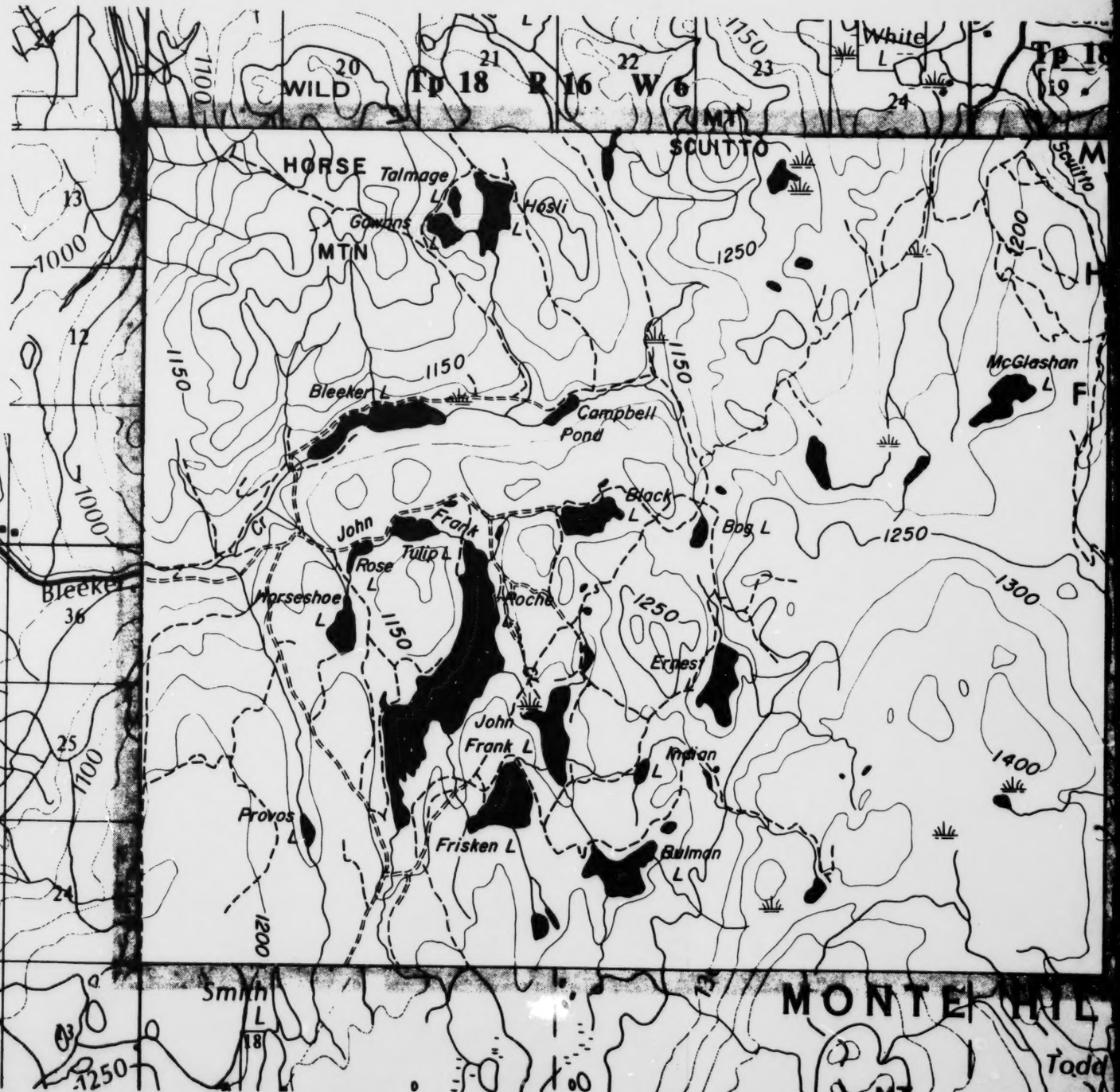
Access — Secondary roads, Rough tracks*

(*May require specialized vehicles, depending upon weather)

SCALE 1: 50,000

Metres 1000 0 1000 2000 3000 4000





Tp 18 R 16 W 6
Tp 18 R 15
SCUITTO
Talmage
Gowans
Hosli
Campbell Pond
Black L
Bog L
John Frank
Tulip L
Rose L
Roche
Ernest
John Frank L
Indian L
Frisken L
Balmon L
McGlashan L
Scuitto
White L
1150
1200
1250
1300
1350
1400
MONTE HILLS
Dam
Todd

PART 2.0 SUBJECTS FOR CONSIDERATION

At the outset, a planning task force was selected from government agencies and other public bodies which were known to have direct concerns in the area (Appendix I). Its members were asked to review a general description of the planning process, and then to identify the specific subjects which their agency or organization was concerned with. It was assured and understood that, insofar as these issues related to Crown land, they would form a foundation for the objectives and would also determine what information each participant was expected to contribute. The responses received are listed, in summary form, below:

Recreation Management: The Roche-McGlashan area, principally because of the concentration of quality sport-fishing lakes within it, is under considerable recreation pressure. The intensity of use has grown to the point that it threatens both the range and quality of recreation experiences and the fish resource itself.

Residential and Commercial Development: The demand for cottage lots and commercial recreation sites in the study area is felt to be high, although little quantitative data is available. The recreational resources in the area are of exceptional value. The opportunities which could be made available for "private" developments on Crown lands would be at the expense of space, resources, and certain aesthetic values for public enjoyment.

Forest Land: Planning for forest land management has previously focussed on the resource-operational level, e.g. "folios" for timber harvest, "coordinated plans" for grazing, and "recreation plans" for development of recreation sites and trails. Plans of these types overlap each other in the Roche-McGlashan area. While they have done much to integrate compatible resource interests, their effectiveness is being reduced by the growing intensity of public use: the area is becoming less remote, and serious land-use conflicts are emerging.

Forestry Operations: The forests of the central Interior Plateau have become over-committed, and there is now a concern that more equipment, manufacturing plant and labour force may be in place than there is timber to sustain it over the long term. The interior Douglas fir forests which are prevalent in the study area are particularly valuable. Whereas much of this forest has been logged and will be many years in regenerating, the continued availability of such lands for production of tree crops is critical to the long-term maintenance of the forest industry.

Agriculture (Grazing): A significant investment of public funds has been made to increase the yields from and efficiency of use of the forage resource in the study area. While the improvements such as fences and water developments have been principally oriented toward beef production, there are benefits to other interests as well, e.g. wildlife. Security for these investments is a significant concern in the face of increasing public use.

Livestock Operations: Private lands produce forage crops to carry domestic livestock through the winter months, but public lands are used for grazing in other seasons. The study area contains some spring and fall range as well as summer pastures, and these are in short supply in the region. Their continued availability, and protection against interferences with livestock distribution, are of direct concern to the viability of at least one ranching operation. (That operation's contribution to grazing management and water resource development, integrating benefits for fish and wildlife and resolving recreation-livestock conflicts, are inferred under other headings.)

Fish and Wildlife: The sport-fishing opportunities represented in the study area are relatively rare in the province, unique in proximity to a population center of any size, and very popular. They are being threatened by more pressure than they can withstand under existing management, partly due to poor distribution of that pressure. Direct means of managing the fishery have consisted of fish stocking programs, lake aeration, stream improvements, participation in water storage projects, and regulations of catch limits and gear restrictions. For the unique array of fishing opportunities in the study area to be maintained, however, the management of land and its vegetation cover, controls on access, and regulation of activities incidental to fishing must also be involved.

Water Supply: The drainage system in the study area is tributary to Campbell Creek. The entire system is severely over-recorded, principally for forage crop irrigation to support the livestock industry. Development of further storage to the capacity of the watershed is required to meet existing commitments. A system is being implemented, amalgamating a number of small storage licences into larger ones. This has involved and integrated fisheries and waterfowl interests. While it is recognized that there are other land use demands on the area, there is concern from a water management perspective that the storage reservoirs be protected from encroachments. It is noted that there is no water available for further consumptive uses.

Water Quality: The ongoing expansion of Roche Lake Resort raises concerns relating to water consumption and sewage treatment. The number of people that the Roche Lake system can stand while water quality is still essentially maintained may already be exceeded. Water and waste management should receive careful consideration in planning for further development (e.g. public campgrounds).

PART 3.0 GOAL AND OBJECTIVES

3.1 GOAL

To prepare a Sub-District Crown Land Planning Report for the Roche-McGlashan Area (Thompson-Okanagan Region) which will guide and secure the management of public lands for their identified social, economic and environmental most suitable purposes.

3.2 OBJECTIVES

a) To examine the appropriateness of Crown land development for agriculture and for commercial, private or public recreation uses in the study area, and to make specific recommendations regarding such development.

b) To resolve the uncertainty in future supply of recreational resources, timber, and livestock forage in the area by allocating Crown lands to their most suitable uses: forest land, or non-forest land for specified purposes.

c) To facilitate a level of management which will resolve the conflicts between recreation and the forest and livestock industries in the area to a level of mutual compatibility.

d) To identify the range and distribution of recreational environments within the area, and to provide clear guidance for the maintenance of recreational resources and the management and control of recreation activities.

PART 4.0 REGIONAL CONTEXT

A useful perspective on the competing demands for Crown land and resources, in preparation for the analysis and land allocation decisions which must follow, can be derived from demographic and economic statistics on the local population.

Table 2 presents figures obtained from the planning departments of the Thompson-Nicola Regional District and the City of Kamloops. Estimates are based on the Statistics Canada 1976 Census, and projections are made from records of housing starts. An average annual growth rate of 3.5 percent since 1976 (1980 showed 3.7 percent) yields a projected City population in five years one-quarter to one-fifth greater than it is now. Growth rates during the 1950's approached 7 percent annually, and major resource and transportation projects proposed for the region may make the 3.5 percent estimate a conservative one. Since the study area is adjacent to the Kamloops urban center, it appears likely that the demands on its resources will experience at least this rate of growth in the next few years.

The population of Kamloops is both young and relatively affluent. Kamloops has a higher percentage of age groups below the age of 44 than is the average for the Province. For ages 45-54, Kamloops figures are similar to those of the Province. The most remarkable difference in the age structure for Kamloops as compared to that for the Province as a whole, however, is the relative scarcity of persons in Kamloops over the age of 55. The income of the young labour force places Kamloops approximately 11 percent higher than the national average in per capita earnings. Traditionally, a high percentage of this income is used for items of discretion, and involvement in outdoor recreation is characteristic.

The community structure is strongly influenced by the resource industries: forest products, mining, and livestock production. Additionally, the transportation industries, light manufacturing, and

Table 2

Projections of Population Growth	Census 1976	1979	1985	1991	% Region	Avg. Annual
KAMLOOPS	58311	59995	77517	90004	71.7	3.45
T.N.R.D.	92104	95409	118520	137241	100	3.1

Table 3

Labour Force Estimates T.N.R.D. 1979			
		# of persons 1979	% of total
Primary Industry	Agriculture	1250	2.9
	Forestry	1585	3.7
	Fishing and Trapping	15	0.1
	Mining	2025	4.7
Secondary Industry	Manufacturing	5150	11.9
	Construction	4400	10.2
Service Industry	Transportation, Utilities & Communication>	4300	9.9
	Trade	6600	15.2
	Finance, Real Estate, Insurance	1200	2.8
	Community Business & Personal Services>	10150	23.5
	Public Administration	2150	5.0
	Unclassified	4400	10.2
	TOTAL	43225	100

businesses which support these enterprises broaden the base so that a complex community now exists. Natural resource-based outdoor recreation remains highly significant as a contributor to the social as well as the economic fabric of the community. Contributions to the labour force from its major components are shown in Table 3.

Estimates of the value of production by economic activity for forestry, mining, tourism and agriculture are shown in Table 4. Although these values are not directly comparable from one sector to another, they do indicate that mining, forestry and tourism are major revenue-earning sectors of the regional economy. The value of agricultural production is clearly important, but of lesser significance relative to these other sectors.

The mining industry produced $427 million worth of minerals within the Thompson-Nicola Regional District during 1980, or about 15 percent of the provincial value of production. Ninety-four percent of this value, or $403 million, is attributed to the production of metals, primarily copper. This represents 28 percent of the value of metal mineral production in the province. The extraction of structural materials accounts for most of the remaining $24 million worth of mineral production. The potential for growth in the mining sector is high, given copper deposits of world significance in the Highland Valley south-west of Kamloops. Further development of these deposits will likely bring about significant growth in mining-related industries, and in the regional population.

The forest industry produced $151 million worth of lumber, plywood and related wood products in 1977 and paid out about $44 million in wages and salaries to 2,472 workers according to data from Statistics Canada. The figures in Table 5 have been adjusted upward to reflect 1980 values. The value of pulp and paper production in the Thompson-Nicola Regional District for 1977 was not documented, but it is likely that the Weyerhaeuser pulp and paper mill in Kamloops accounted for most of the $133 million of goods produced by "other industries" and the $18 million of wages and salaries paid out.

Whereas market conditions have resulted in recent troubles for all facets of the forest industry, the long-term outlook for forest production is relatively stable.

The Ministry of Tourism estimates that revenues generated from tourists to the Thompson-Nicola region were $155 million in 1980. Approximately 8 percent of these revenues are attributed to expenditures made by local residents and another 32 percent from other B.C. visitors. An important component of the tourist industry is fishing and boating; almost one of every four tourists to this region takes part in these two activities.

Farm cash receipts from agricultural production in the Thompson-Nicola region (Kamloops Agricultural District) were estimated by Ministry of Agriculture at roughly $26 million in 1980. The sale of cattle and calves accounted for more than 80 percent of the region's receipts, indicating the importance of the cattle industry in regional agriculture. Approximately 20 percent of the provincial production of beef cattle comes from the Kamloops district. A modest food and beverage industry is also present in Kamloops, producing another $5 million to the regional economy.

A significant impact is anticipated in the Kamloops area with completion of the Coquihalla highway, and the recreational resources of the Thompson Plateau surrounding the City will experience this directly. The new highway is projected to reduce travel time to the lower mainland by one hour: approximately 20 percent off of the effective distance from the immense recreational demand resident in the Vancouver metropolitan area. Tourism and related small business opportunities may therefore experience an increase in economic terms relative to other sectors. Potential conflicts are apparent for the livestock industry (dependent on grazing multiple-use Crown lands), perhaps to a lesser degree for the forest industry, and certainly for the recreational resource base. The Coquihalla highway will also bring the Vancouver market for food products effectively closer, perhaps eliciting some changes and growth in the agricultural sector.

Table 4

ESTIMATES OF VALUE OF PRODUCTION BY ECONOMIC ACTIVITY FOR THE THOMPSON-NICOLA REGIONAL DISTRICT, 1980 (millions of $)

	THOMPSON-NICOLA REGION	PROVINCE	THOMPSON-NICOLA AS % OF B.C. (%)
Forest Industry[a]		7360	
Wood Industry	181	4187	4.3
Paper & Allied Industries		3173	
Mining (including non-metals)[b]	427	3010	14.2
Metals	403	1423	28.3
Structural Materials	23	210	11.0
Tourism Revenues[c]	155	1800	8.6
Agriculture (Farm Cash Rec.)[d]	26	750	3.5
Cattle and Calves	22	125	17.6
Food and Beverage Ind.[e]	5		

[a]Source: Statistics Canada Catalogue 31:209 (1977). (Adjusted to reflect 1980 values)
[b]Source: Ministry of Energy, Mines and Petroleum Resources, Annual Report 1980. Figures include production from Kamloops and Nicola Mining Divisions.
[c]Source: Policy Development and Planning Branch, Ministry of Tourism
[d]Source: Farmland Resources Branch, Ministry of Agriculture and Food
[e]Source: Statistics Canada Catalogue 31:209 (1977). (Adjusted to reflect 1980 values)

Note: These figures are estimates only and not directly comparable.

The ideal measure for comparing the economic values of these resources would be their "value-added" (i.e. value of production minus costs). "Value-added" would in effect measure the contribution to G.N.P. or G.P.P. (gross provincial product). The main difference between "value-added" and the values noted in Table 5 is that the latter will overstate to varying degrees the actual contribution of that resource sector to G.P.P. Unfortunately, value-added figures are not available at the regional level for all sectors.

Tourism revenues are difficult to estimate, and the figures shown are very approximate. Much of the tourism revenue figure apparently comes from overnight accommodation of tour groups and conventions which have little relationship to the area's natural or heritage values.

Agricultural values are significantly lower than the mining and forest sectors due to the lack of processing within the region. If the value of processing attributed to the cattle sold from Kamloops District farming were added on, a significantly higher value for agriculture would result. To give an indication of the extent of this additional value, slaughtering and meat processing in B.C. alone produced $181 million in 1976 (approximately 100,000 head of cattle were slaughtered in that year plus 90,000 hogs and sheep). The provincial slaughter and meat processing industry has since grown.

There are slight differences in geographical areas used. Only the forest values are based on T.N.R.D. boundaries. The agriculture values have been estimated for the Kamloops District which more or less coincides with the T.N.R.D. boundary. Mining values are taken from the Kamloops and Nicola Divisions, which are considered to be a good representation of mineral values for T.N.R.D. Tourism values cover an area which also includes much of the Columbia Shuswap Regional District (as far as the eastern boundary of Glacier National Park) but does not include the Clinton area in the T.N.R.D.

PART 5.0 RESOURCE AND LAND-USE INVENTORY

For the purpose of developing land-use strategies in accordance with planning objectives, the statements contained in Part 2.0 must be supplemented with further information. By organizing the expressed concerns into categories which focus on demands on the land rather than on the specific sources of that demand, detailed inventory mapping may be carried out.

Map 1 shows the study area, indicating roads, drainage and topography. Map 2 indicates the distribution of privately-owned or leased land and rights-of-way, which are all generally unalterable commitments. Map 3 shows government reserves, reflecting previous efforts to recognize public interests by Crown land designations. These may be modified through comprehensive planning. Utilizing the drainage for orientation, a base map is derived on which to show the other relevant information for land-use planning. This part of the resource and land-use inventory is organized as follows:

	Maps
1. Recreation	4
2. Fish Management	5
3. Livestock Grazing	6
4. Timber	7,8,9
5. Water	10

Inventory mapping presents data on existing management, and on the capability of the lands and resources in the area to support demands on them. Whereas these are assessed for each demand exclusive of other competing interests, competition and conflict among resource values can be revealed by comparison of map-sheets. For the sake of brevity, only the inventory maps noted above and a summary of the key considerations (Table 5) are presented in the main body of this document. Details on the nature of the demands, the competition or conflicts between them, the specific issues in need of resolution, and the minor components of the resource and land-use inventory are contained in Appendix II.

TABLE 5 LAND-USE INVENTORY SUMMARY

DEMAND	CAPABILITY	EXTENT & INTENSITY OF USE	NEEDS AND FLEXIBILITY	CONSEQUENCES OF INADEQUATE REPONSE
RECREATION	LAKES AND ASSOCIATED WATERSHED(S) HAVE REGIONAL AND PROVINCIAL SIGNIFICANCE FOR SPORT FISHING. WILDLIFE OBSERVATION, HUNTING, CAMPING AND RELATED "WILDERNESS" ACTIVITIES ARE POPULAR IN THE VICINITY OF ROCHE AND ITS "SATELLITE" LAKES.	CROWDING IS EVIDENT ON ROCHE LAKE; USE OF THE "SATELLITE" LAKES IS INCREASING, BUT LIMITED BY THE CONDITION OF ACCESS ROADS. (MCGLASHAN IS A SEPARATE AREA.) UNREGULATED CAMPSITES ARE EXPERIENCING A HIGHER INTENSITY OF USE, MORE CONFLICTS BETWEEN INCOMPATIBLE ACTIVITIES, AND LOSS OF RECREATION VALUES.	ACCESS AND FACILITIES COULD EFFECT RELOCATION OF USE TO "SATELLITE" LAKES AND RELIEVE THE PRESSURE ON ROCHE LAKE. REGULATION IS REQUIRED TO PREVENT SPREADING OF CONFLICTS WHERE DEMAND EXCEEDS THE CAPACITY OF THE RESOURCE, TO EITHER MAINTAIN "WILDERNESS" VALUES OR A STATE OF MORE INTENSIVE RECREATION.	LACK OF RECREATION MANAGEMENT WILL RESULT IN CONTINUED DETERIORATION OF RECREATIONAL VALUES, GENERALLY RISING CONFLICTS BETWEEN RECREATIONISTS, AND LOSS OF PROVINCIALLY SIGNIFICANT OPPORTUNITIES.
FISH AND WILDLIFE	LAKES ARE HIGHLY PRODUCTIVE, SMALL, AND SHALLOW; MOST PRODUCE TROUT WITH HIGH GROWTH RATES, BUT "WINTERKILL" IS A PROBLEM IN SOME. WATERFOWL VALUES ARE CONSIDERABLE ON THE WETLANDS. RIPARIAN HABITATS, ASPEN STANDS AND OLD-GROWTH FIR ARE ALSO IMPORTANT FOR WILDLIFE PRODUCTION.	FISHING PRESSURE ON ROCHE LAKE IS HIGH, AND PRESSURE ON OTHER LAKES IS MODERATE BUT INCREASING. HEAVY HUNTING IS ASSOCIATED WITH THE ACCESS SYSTEM, BUT SUCCESS IS LOW. NATURE STUDY IS A MINOR USE WHERE POTENTIAL EXISTS BUT VALUES ARE DIMINISHED BY PAST RESOURCE EXPLOITATION.	COMPREHENSIVE MANAGEMENT OF HABITAT AND LAND USE (AS WELL AS FISH HARVESTS) WILL BE REQUIRED TO MAINTAIN A VARIETY OF FISHING OPPORTUNITIES ON THE DIFFERENT LAKES. USE OF ROCHE LAKE SHOULD NOT BE INCREASED, BUT SATELLITE LAKES HAVE SOME ADDITIONAL CAPACITY. WETLAND, RIPARIAN AND UPLAND WILDLIFE HABITATS REQUIRE ATTENTION.	IF ACCESS AND USE ARE NOT SOMEHOW LIMITED, THE FISHERY RESOURCE MAY DETERIORATE FROM A TYPE WHICH IS UNCOMMON TO THAT WHICH IS COMMON (IN THE REGION); OPPORTUNITIES TO INCREASE FISH AND WILDLIFE BENEFITS FROM THE AREA COULD BE LOST.
LIVESTOCK GRAZING	SPRING AND FALL LIVESTOCK RANGE VALUES ARE LOCALLY SIGNIFICANT IN THE OPEN FORESTS BELOW 1150 m, PREDOMINANTLY IN THE WESTERN HALF OF THE PLAN AREA AND NEAR SOURCES OF WATER. SUMMER RANGE VALUES PREDOMINATE AT HIGHER ELEVATIONS TO THE EAST.	THE AREA IS ALMOST ENTIRELY IN, AND CONSTITUTES THE MAJORITY OF ONE GRAZING MANAGEMENT UNIT. THE RANGE IN THIS UNIT IS USED TO CAPACITY, AND CRITICAL TO ONE OPERATOR (WILLOW RANCH).	PROTECTION IS REQUIRED FOR COORDINATED RESOURCE MANAGEMENT PLANNING AND A.R.D.S.A. INVESTMENTS MADE FOR IMPROVING EFFICIENCY OF LIVESTOCK USE OF THE RANGE AND REDUCING LIVESTOCK-RECREATION CONFLICTS. INCREASING PUBLIC USE NEEDS TO BE EITHER DISCOURAGED OR MANAGED/REGULATED.	LACK OF PROTECTION FROM INCREASING NUMBERS OF PEOPLE (LIVESTOCK-RECREATION CONFLICTS) WILL ENDANGER ONE MAJOR CATTLE OPERATION, AND RETURNS FROM PREVIOUS INVESTMENTS IN RANGE MANAGEMENT MAY BE FORFEIT.

TABLE 5 LAND-USE INVENTORY SUMMARY (cont'd.)

DEMAND	CAPABILITY	EXTENT & INTENSITY OF USE	NEEDS AND FLEXIBILITY	CONSEQUENCES OF INADEQUATE REPONSE
TIMBER SUPPLY	MODERATE CONDITIONS FOR TREE GROWTH PREDOMINATE IN PINE AND SPRUCE TYPES IN THE EASTERN AND SOUTHERN PARTS OF THE STUDY AREA; POOR SITES IN DOUGLAS FIR OVER THE CENTRAL, NORTHERN AND WESTERN PARTS. AREAS NEAR THE NORTH HALF OF ROCHE LAKE AND NEAR "E" LAKES HAVE NOT REGENERATED AFTER LOGGING.	FOREST HARVESTING TENURES TEND TO COMMIT THE LAND ALONG THE EASTERN EDGE OF THE STUDY AREA, AND TO A LESSER DEGREE IND THE SOUTH-WEST AND NORTH-WEST CORNERS. WHEREAS PART OF THE CORE "LAKES AREA" IS IN EXISTING PROVINCIAL FOREST, IT IS GENERALLY NOT INVOLVED IN ANY CURRENT FOREST TENURE.	THE TIMBER RESOURCES OF THE REGION ARE OVER-COMMITTED IN TERMS OF EXISTING PLANT AND LABOUR FORCE, AND CONTINUED ACCESS TO ALL FOREST LANDS FOR HARVESTING IS THEREFORE IMPORTANT. HARVESTS IN THE VICINITY OF RECREATIONAL LAKES CAN BE DELAYED AND/OR SELECTIVE HARVESTING METHODS USED TO PROTECT RECREATIONAL VALUES.	IF TIMBER HARVEST IS PRECLUDED IN AREAS OF SIGNIFICANT SIZE, SOME LONG-TERM LOSS OF OPPORTUNITIES IN INDUSTRY MAY RESULT, AND FOREST DISEASE HAZARD WILL INCREASE. INCREASED HUMAN PRESENCE (ESPECIALLY OVER-NIGHT OR PERMANENT USE) ELEVATES THE FIRE HAZARD.
WATER	THE STUDY AREA WATERSHED PRODUCES A FINITE QUANTITY OF WATER, WHICH IS LOW IN NATURAL NUTRIENT CHEMICALS.	BOTH BASE FLOWS AND EXISTING STORAGE ARE OVER-COMMITTED BY IRRIGATION DIVERSIONS; AN UPGRADED STORAGE SYSTEM IS BEING DEVELOPED ON EXISTING (AMENDED) LICENCES. NOTE: FISHERY AND RECREATION ARE WATER-DEPENDANT.	WATERSHED PRODUCTION IS FULLY COMMITTED BY EXISTING DIVERSION LICENCES. WATER QUALITY IS SENSITIVE, AND SIMPLE WASTE TREATMENT METHODS WOULD LIKELY BE INADEQUATE. INCREASING HUMAN USE NEEDS TO BE LIMITED, AND REGULATED.	CONFLICTS BETWEEN RESERVOIR FLUCTUATION AND SHORELINE DEVELOPMENT, DETERIORIATION OF WATER QUALITY, AND VANDALISM OF STORAGE WORKS MAY BE ASSOCIATED WITH INCREASES IN PUBLIC OR PRIVATE USE CLOSE TO LAKE SHORELINES.
HOUSING AND COMMERCIAL DEVELOPMENT	SOME CAPABILITY FOR CABIN DEVELOPMENT ON THE LAKESHORES (ROCHE LAKE HAS YEAR-ROUND ACCESS AND "HYDRO").	ONE COMMERCIAL RESORT (PRIVATE), THREE CABIN-SITES (LEASE); ALL ON ROCHE LAKE.	PLANNING BY THE T.N.R.D. HAS DETERMINED THAT FURTHER "SETTLEMENT" USES ARE NOT DESIRABLE IN THIS AREA.	FURTHER "SETTLEMENT" WOULD RAISE THE INTENSITY OF USE IN THE AREA AND ENDANGER ALL OTHER PUBLIC-RESOURCE INTERESTS, WITH BENEFITS LIMITED TO A FEW INDIVIDUALS.

ROCHE-McGLASHAN CROWN LAND PLAN

INVENTORY MAP*2-ALIENATED LAND

PRIVATE LAND

CROWN GRANT RIGHT OF WAY

LAND ACT LEASE

PLAN BOUNDARY

SCALE 1:50,000

Metres 1000 0 1000 2000 3000 4000

Tp 18 R 17 W 6

Tp 18 R 16 W 6

Tp 17 R 17 W 6

Tp 17 R 16 W 6

WILD

HORSE

Talmage L

Commans MTN

Holli L

MT SCUTTO

White L

McClashan L

Bleeker L

Bleeker L Dam

Brigade Hill 1148

Brigade L Dam

Trapp Lake

Richie L

Horseshoe L

John Frank Dam

Roche L

Ernest Dam

John Frank L

Provost L

Frisken L

Indian L

Bulman L

Smith L

Dam 2

Bog L

MONTE HILL

Todd

ROCHE-McGLASHAN CROWN LAND PLAN

INVENTORY MAP*3-GOVERNMENT RESERVES

U.R.E.P. RESERVE

PROVINCIAL FOREST

AGRICULTURAL LAND RESERVE

MINERAL STAKING RESERVE

LAND ACT RESERVE (other than U.R.E.P.)

PLAN BOUNDARY

SCALE 1:50,000

Metres 1000 0 1000 2000 3000 4000

Tp 18 R 16 W 6

Tp 18 R 15

Tp 18 R 16 W 6

Tp 18 R 15

Tp 17 R 16 W 6

MONTE HILLS

MT SCUITTO

Talmage L

Holli L

White L

McClashan L

Roche L

Frank L

Ernest

Indian L

Brisken L

Bulman L

Todd

Dam

Bog L

Tp 18 R 17 W 6

BRIGADE HILL 1148

Brigade L

Trapp Lake

Richie L

Tp 17 R 17 W 6

IR 2 553

IR 3 554

IR 4 556

IR 5 555

Bleek

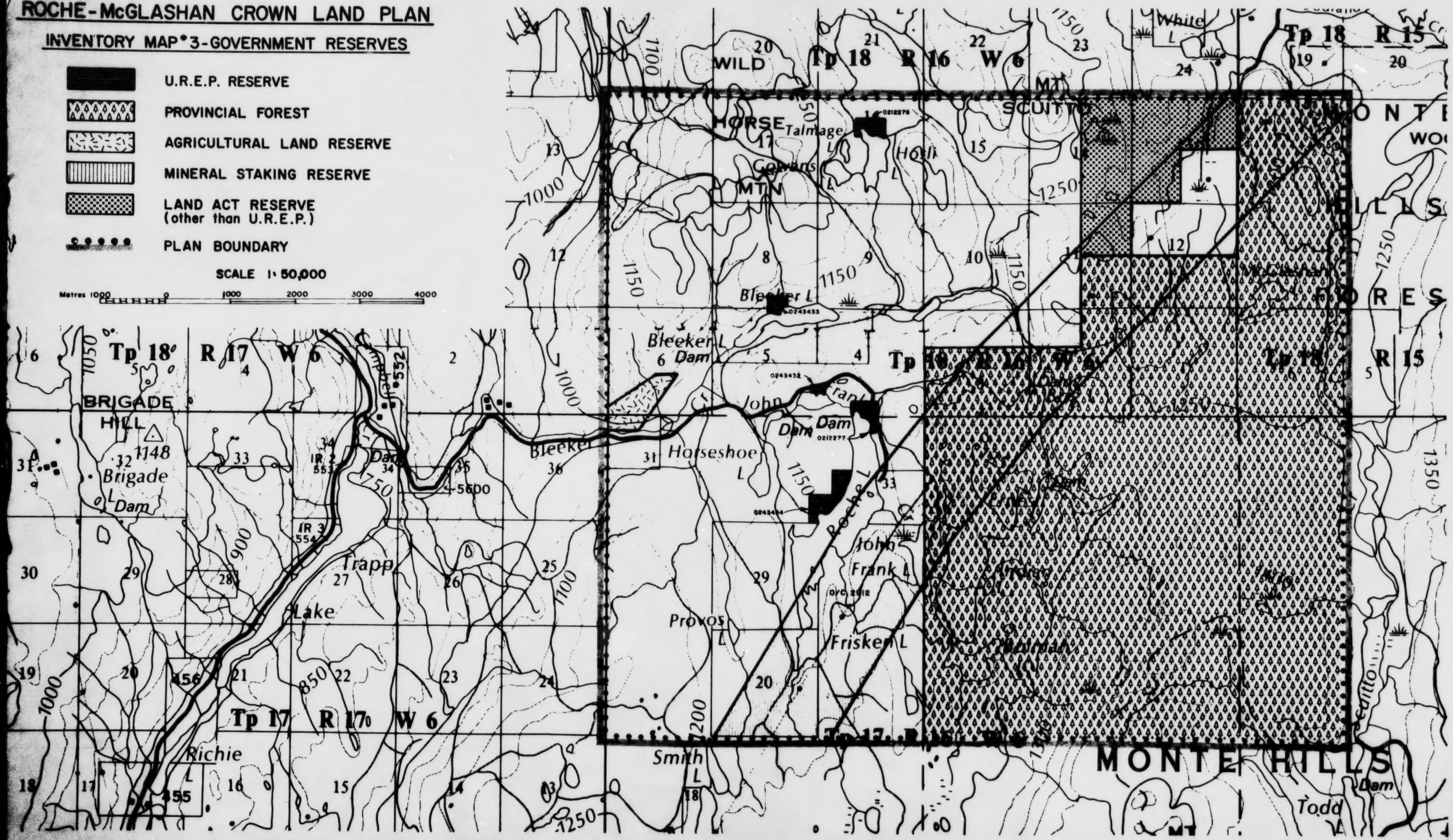
ROCHE-McGLASHAN CROWN LAND PLAN

INVENTORY MAP*3-GOVERNMENT RESERVES

- U.R.E.P. RESERVE
- PROVINCIAL FOREST
- AGRICULTURAL LAND RESERVE
- MINERAL STAKING RESERVE
- LAND ACT RESERVE (other than U.R.E.P.)
- PLAN BOUNDARY

SCALE 1: 50,000

Metres 1000 0 1000 2000 3000 4000



EXISTING MANAGEMENT

- Serviced Campsites
- Unserviced Campsites
- Boating Regulations - no motors

PROPOSALS FOR CONSIDERATION
(from Kamloops Flyfishers Plan and Others)

- Potential Campsite Improvement
- Potential Campsite Development
- ==== Road Maintenance or Improvement
- ---- Road Closures (walking trail)
- Boating Regulations - no motors (on all other lakes - 16 km/hr.)
- Snowmobile Closure - south of ------

For Recreation Reserves Location, see Map No. 3
For Fishery Management, see Map No. 5

SCALE 1:50,000
0 1000 2000 3000 4000 meters

N

ROCHE-McGLASHAN CROWN LAND PLAN

Inventory Map No. 4 - RECREATION RESOURCES AND MANAGEMENT

SPAWNING STREAMS ——

FISHERY VALUE OF LAKES

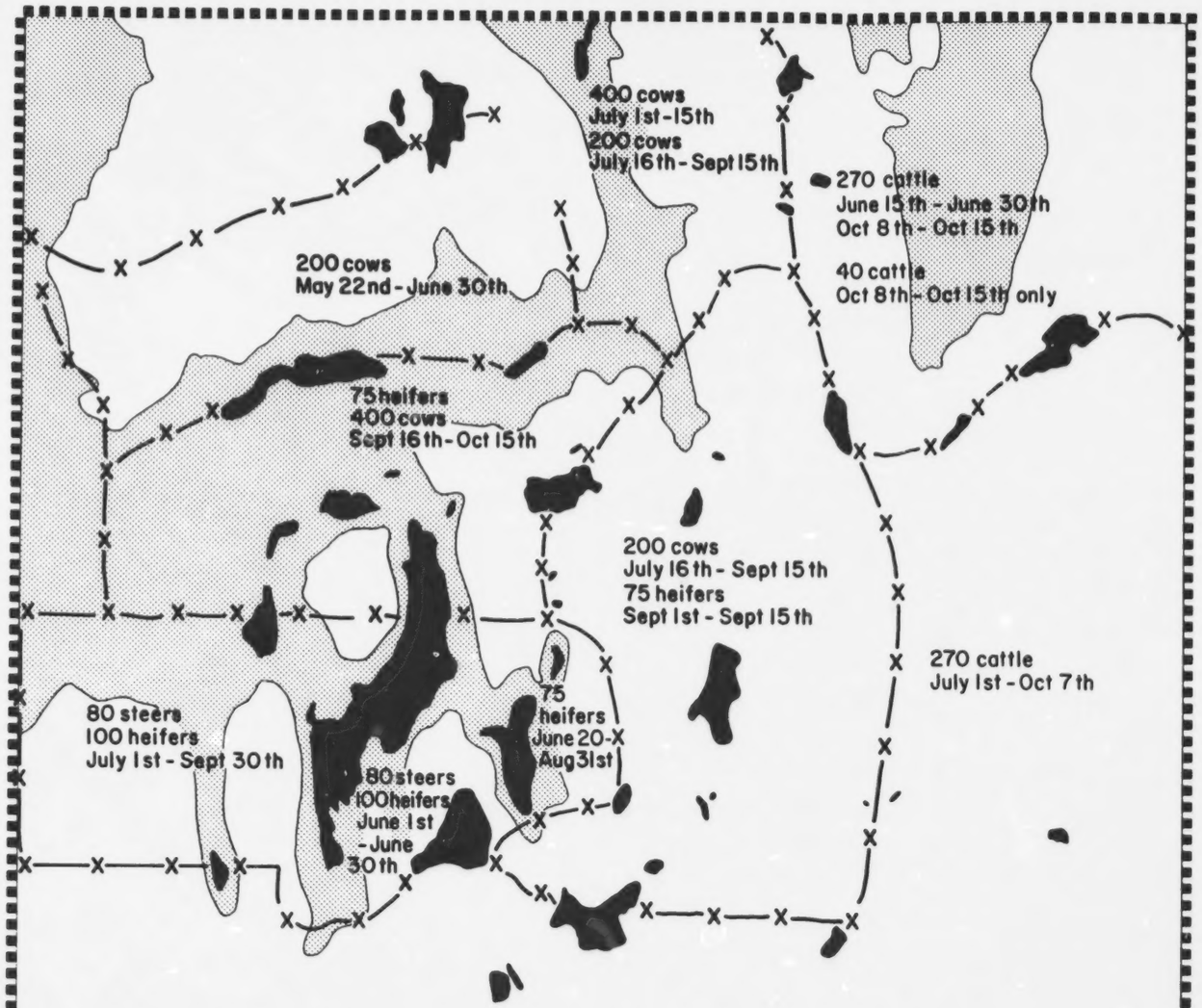
high	1
medium	2
low	3
STOCKED	S
WINTERKILL	W
TROPHY LAKE	T
AERATION	
electrical	A
pondmill	PM
SPECIAL REGULATIONS	R

SCALE 1:50,000

0 1000 2000 3000 4000 meters

ROCHE-McGLASHAN CROWN LAND PLAN

Inventory Map No. 5 - FISH RESOURCES AND MANAGEMENT



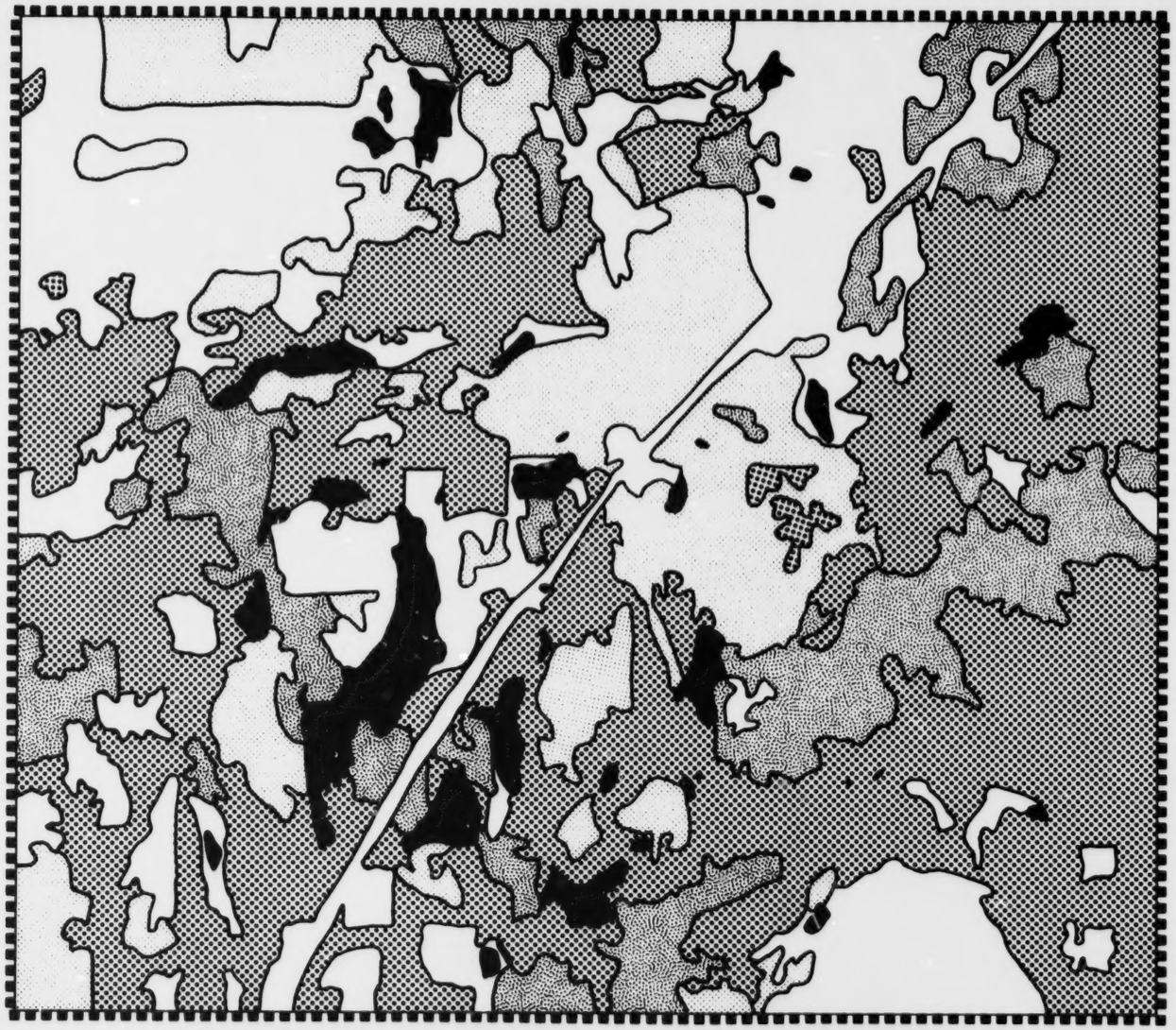
1150 m CONTOUR
Spring - fall range at lower elevations shown ; summer range above.

X—X—X PASTURE FENCES
(Grazing intensity and schedule as shown

SCALE 1:50,000
0 1000 2000 3000 4000 meters

ROCHE - McGLASHAN CROWN LAND PLAN

Inventory Map No. 6 - LIVESTOCK GRAZING VALUES AND MANAGEMENT



MATURE TIMBER
CLASS 7⁻ - FIR & SPRUCE, 5⁻ - LODGEPOLE PINE

THRIFTY IMMATURE TIMBER
CLASS 5,6 - FIR & SPRUCE, 3,4 - LODGEPOLE PINE

IMMATURE TIMBER
CLASS 1-4 - FIR & SPRUCE, 1,2 - LODGEPOLE PINE

INSUFFICIENTLY RESTOCKED

LAKES

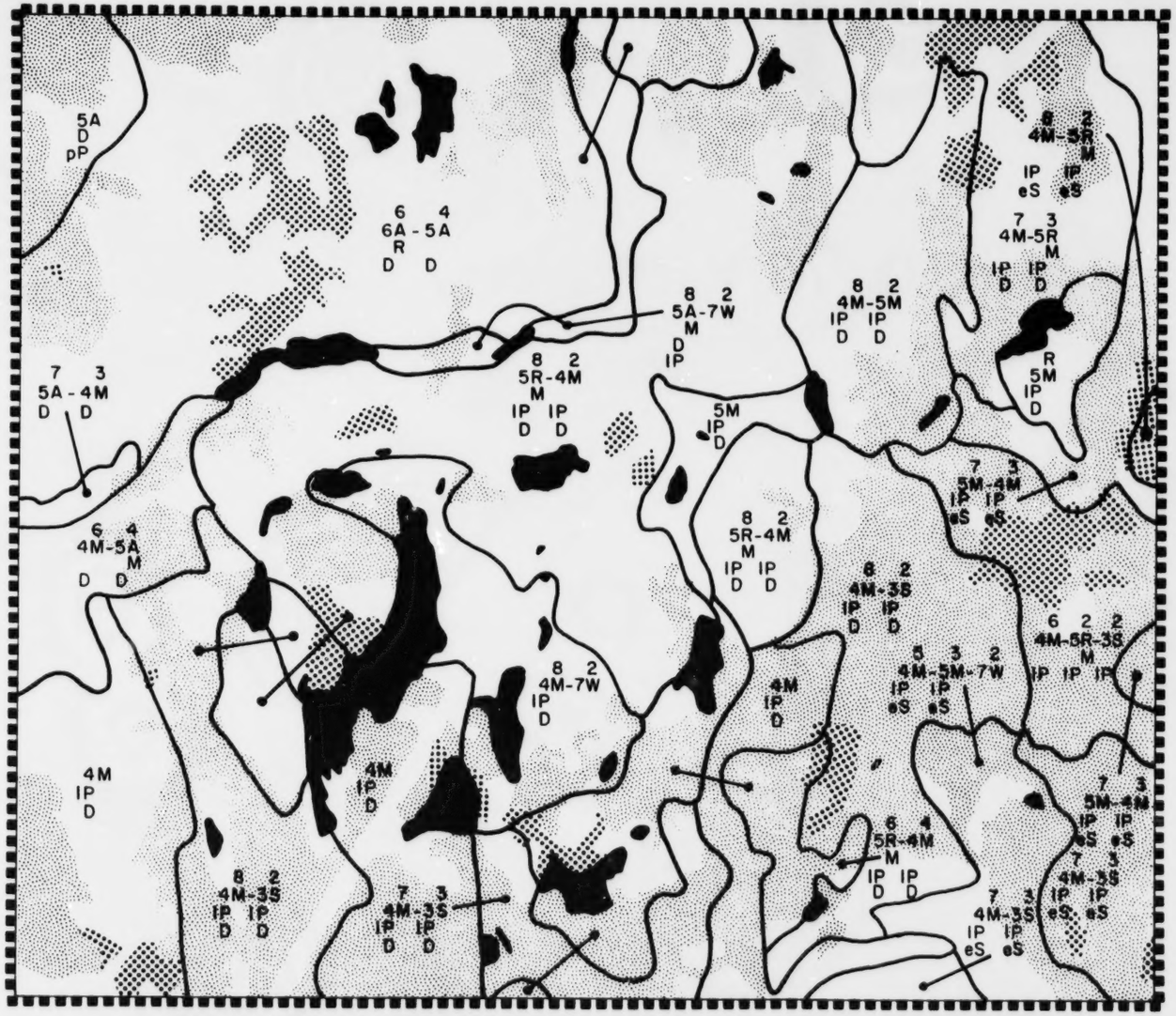
SCALE 1:50,000

0 1000 2000 3000 4000 meters

N

ROCHE-McGLASHAN CROWN LAND PLAN

Inventory Map No. 7 - TIMBER RESOURCES



ROCHE-McGLASHAN CROWN LAND PLAN

Inventory Map No. 8 - FOREST CAPABILITY

SITE CLASS (Forest Productivity by Regional Standards)

Determined by application of tree age and height measurements to a normal growth curve. Results show how well a specific tree stand is growing compared to stands of a similar forest type throughout the Region. Mean Annual Increments are usually attached to Site Classes for each species type but the following are average figures.

GOOD SITE (Average M.A.I.- 2.9m³/yr.)

MEDIUM SITE (Average M.A.I.- 2.1m³/yr.)

POOR SITE (Average M.A.I.- 1.05m³/yr.)
Also includes Low Site, Non Commercial, Non Productive, Open Range, Rock, etc.

Limitation of Site Class and M.A.I. attached is that it gives only an indication of current growing productivity. Many sites are classed as Poor or Medium because they are overmature or overstocked. This means they are putting on very little Height as compared to Age. A young healthy stand is required to obtain a true indication of site productivity.

B.C.L.I. - CANADA LAND INVENTORY (Forestry)

Capability classes are based on soil survey and climate information. Potential productivity is shown as a range M.A.I. averaged for the indigenous tree species.

Class 3 - Productivity 5.0 - 6.0m³/yr.

Class 4 - Productivity 3.6 - 4.9m³/yr.

Class 5 - Productivity 2.2 - 3.5m³/yr.

Class 6 - Productivity 0.8 - 2.1 m³/yr.

Class 7 - Productivity 0.0 - 0.7 m³/yr.

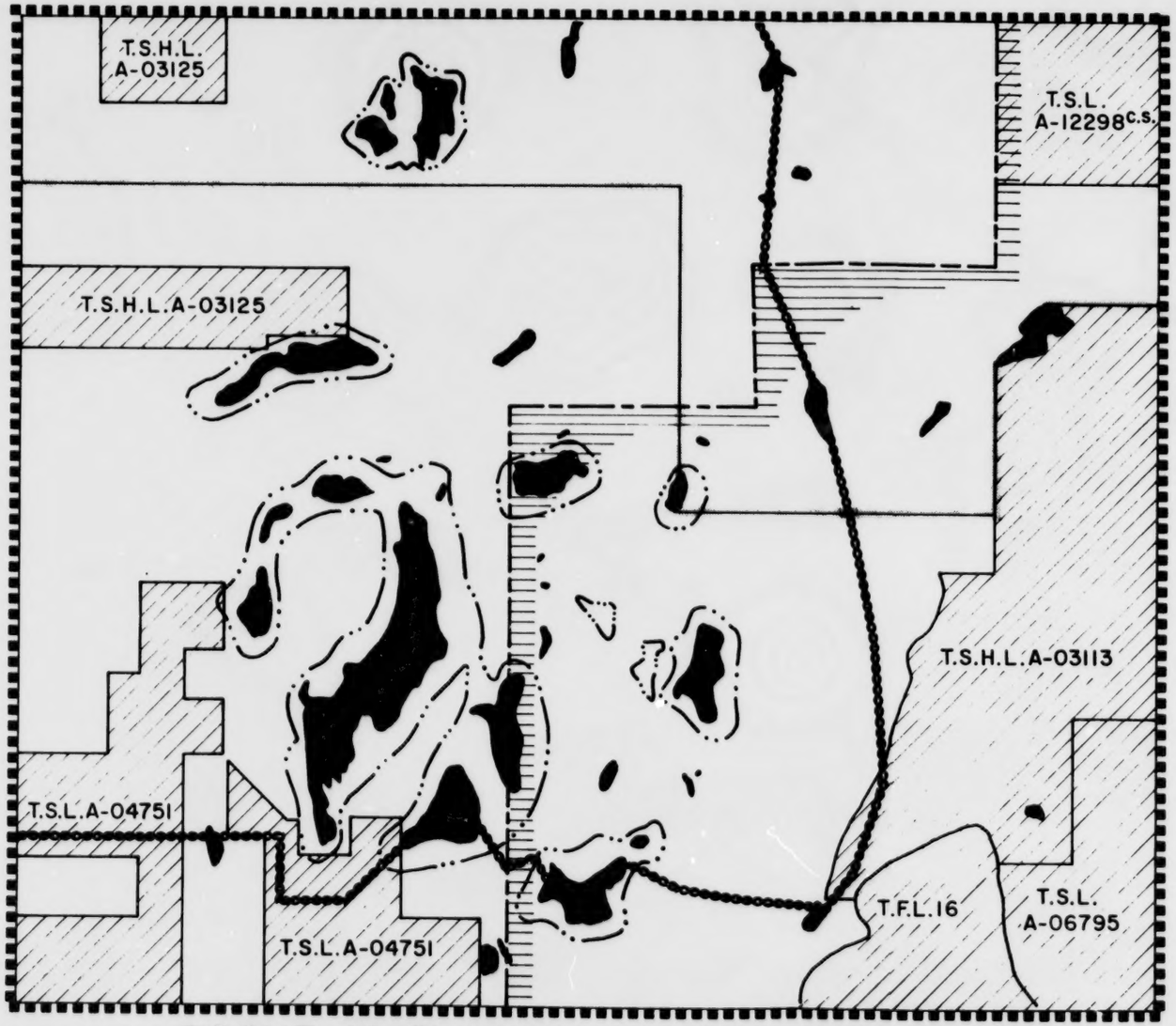
For details of C.L.I. classification system see published key.

Lakes

SCALE 1:50,000

0 1000 2000 3000 4000 meters

N



TIMBER SALE LICENCE

LAKES

ENVIRONMENTAL PROTECTION AREAS

PROVINCIAL FOREST BOUNDARY

BLEEKER LAKE C.R.M.P. BOUNDARY

SCUITTO CREEK FOLIO BOUNDARY

SCALE 1:50,000

0 1000 2000 3000 4000 meters

N

ROCHE-McGLASHAN CROWN LAND PLAN

Inventory Map No. 9 - FOREST ADMINISTRATION

NATURAL LAKES

AREAS ALIENATED FOR RESERVOIRS

DAM	
1	BLEEKER LAKE
2	JOHN FRANK CREEK
3	ROSE LAKE
4	TULIP LAKE
5	ROCHE LAKE
6	BLACK LAKE
7	BOG LAKE
8	JOHN FRANK LAKE
9	FRISKEN LAKE
10	BULMAN LAKE
11	ERNEST LAKE
12	CAMPBELL POND

SCALE 1:50,000

0 1000 2000 3000 4000 meters

N

ROCHE-McGLASHAN CROWN LAND PLAN

Inventory Map No. 10 - WATER RESOURCES AND MANAGEMENT

PART 6.0 ANALYSIS

The Roche-McGlashan area has an extraordinary sport fishery associated with its several lakes, and the demand for this particular recreational resource will likely continue to increase in the foreseeable future. The area is otherwise one of modest but heavily subscribed or committed forest resources: timber, forage, wildlife, watershed, and non-fishing recreation values.

The inventory section suggests that the fish resources in the various lakes have been sensitive to increasing levels of use. Further, sport fishing and related activities involve a complex of quality parameters, which are known to be sensitive to increasing use-intensity and conflicts between different recreation or fishing styles.

The inventory reveals that McGlashan Lake is on a different tributary-watershed and a different access system from the rest of the major lakes in the study area. The rest of the lakes (including Hosli) are all on the Bleeker Creek watershed and sufficiently accessible from the Bleeker Creek road to be managed as a unit.

Significant enhancement opportunities may be available to increase both the level of use and the quality and variety of fishing experiences in the study area. If these opportunities are pursued, however, it must be with caution. Simple improvements in access and facilities may result in a rapid increase in user numbers far beyond the level at which the current fishery (much less the intangibles of "quality") can be maintained. This deterioration is evidently proceeding even without such access and facility improvements, attributable only to increases in human population. Conflicts have been most evident in the Roche Lake area, especially in the last five years.

A profound increase in recreation demand on the area is foreseeable within the decade: in the same time-frame as major developments are

planned in the transportation and industrial sectors. The focus of this pressure will be determined by access, and therefore will predominantly affect the Roche-Hosli group of lakes and spare (relatively) the eastern part of the area and McGlashan Lake.

The manipulation of fish populations through stocking rates, lake aeration, and special regulations may not be sufficient to accommodate anticipated increases in user demand without significant reductions in fish numbers or size, unless there is concurrent control of access and facilities. Without direct management of recreation, the fishing and the quality of fishing experiences are likely to deteriorate more-or-less uniformly on all of the lakes in the Bleeker watershed. Given the enduring popularity of sport-fishing, and the location of the area relative to population centres and transportation corridors, the area will undoubtedly remain popular. Its exceptional status among outdoor recreation areas will be lost, however, unless a commitment is made to maintain that status.

There have been commitments made in the study area to existing ranching units, by irrigation water licences and by long-term investments in the forage resource. These are critical to the viability of the operations concerned. To date, livestock control and water resource management involving the range user have been successful in minimizing conflicts with recreation interests, and in places may have enhanced recreation values. The usefulness of the area to livestock, however, may be impaired as expected increases in recreational pressure take place unless recreation management is effective at limiting levels of use. While there may be capacity to increase recreation use without compromising either the grazing or water storage commitments, that may be realized only if recreation is adequately serviced, directed and contained. Specific commitments to recreation may be necessary for those recreation management investments to be possible.

It has been noted that the long-term maintenance of plant and work force in the forest industry is dependent on making as great as

possible a commitment of Crown land to timber production (and compatible uses). Although the Roche-McGlashan area is relatively small, there are significant timber resources within it. Reviewing the inventory maps, it appears that over much of the area a timber production commitment would be relatively uncontested. The Bleeker Creek watershed is a possible exception because of the logging which has already occurred, and the potential impact of further logging and logging roads on the recreation values noted.

The responsibilities of the Ministry of Forests in managing timber and forage require that resource values for recreation, fish and wildlife, and watershed be recognized. Provincial Forests recognize production of timber and forage as the predominant uses, but within that multiple-use context. The upper Bleeker Creek watershed is emerging as the focus of this planning process on the question of whether it should be managed as Provincial Forest, or whether its size and the intensity of recreation use would support a designation which recognizes recreation as the predominant use. A formal "recreation" designation would constitute a de-emphasis of the forest crop interest, and would enable more intensive recreation management.

"Recreation" designations can either be exclusive or multiple-use oriented. The former type (Class "A" Parks) may emphasize either natural environment values, or intensive recreation with maximum facilities and numbers of people. It would generally preclude logging and restrict other resource-harvest activities. This may not be a contentious point, since much of the Bleeker Creek watershed has not regenerated adequately from logging in the 1950s, and has not been committed by any current forest tenure. Some degree of timber harvest however, particularly after the twenty year horizon, may be desirable both from economic and from ecosystem management points of view. Multiple-use recreation designations (Class "B" Parks and Recreation Areas) can involve comprehensive management of resources, access, facilities, and activities, for recreation and multiple compatible uses. This type of designation does not, for instance, preclude timber harvest, but would make it a subordinate consideration.

It has become evident that Crown land alienations for agricultural, residential, commercial, or other private development would conflict with every other sector in an area which is already oversubscribed by its existing complement of desirable uses. There is no land currently capable of sustaining forage crop agriculture within the study area boundaries. While there may be general land capability for recreation-oriented cabin-sites, further alienation of Crown lands for these and other settlement-type uses must be considered inappropriate (unsuitable) in light of resource and recreation considerations, and in light of both Regional District zoning and the recommendations of various operational plans previously undertaken by other provincial authorities and interest groups.

The possibility of mineral exploration and mining activity in the study area seems slight, given the absence of either recent or current mineral claims. Even so, this possibility represents a serious concern for the maintenance of recreational values in the Bleeker Creek watershed. The construction of mineral exploration roads or any such related activity would be severely destructive of recreation values and disruptive to management in this sensitive area.

In conclusion, it appears that all of the Crown lands in the Roche-McGlashan study area should be preserved in public ownership and managed for public purposes, rather than being subject to private-interest alienations. A large portion of it is uncontested by demands which would challenge recognition of timber and native forage crops as the predominant purposes, accommodating compatible resource interests. This portion, constituting about half of the total study area, could appropriately be designated "Provincial Forest". There is also, however, in the upper Bleeker Creek watershed, an aggregation of lakes and lands visually and ecologically bound to them wherein "Provincial Forest" status is not so obviously indicated by resource values and user interests. Three alternative ways of dealing with this core area - by Provincial Forest, Class A Park, or Class B Park-Recreation Area designation - are explored in the following Part:

PART 7.0 LAND-USE ALTERNATIVES

This Part presents three alternative frameworks for Crown land administration and management in the Roche-McGlashan area. From the Analysis section, it is apparent that consideration of alternatives need only take place in the Roche-Hosli lakes core, shown for reference on Map 11. The three alternatives are therefore alike in proposing a Provincial Forest designation over the remaining land.

The following management options are presented at a conceptual level for discussion and comment. The purpose of this step in the planning process is to determine, without going into detailed operational issues, whether an area ought to be recognized for special management, what its boundaries ought to be, and what policies with respect to management are necessary to ensure that it achieves its purpose.

7.1 PROVINCIAL FOREST ALTERNATIVE

Under a Provincial Forest designation, the core area would continue to be grazed by livestock and subject to timber harvest, under management direction from the Ministry of Forests. Integration of various compatible resource interests would occur through grazing and harvesting plans. As noted in the previous section, a Provincial Forest designation would constitute a land commitment to timber and forage production as the predominant purposes within a compatible multiple use context. Other forest resources such as fish and wildlife and water in the area would still be allocated and managed directly by agencies with the specific mandates (Ministry of Environment). It would be possible for the Ministry of Forests to apply to the Ministry of Energy, Mines and Petroleum Resources for a mineral reserve, to preclude exploration and staking over any sensitive area where mineral occurrence is known to be unlikely.

The Provincial Forest alternative for the core area would maximize opportunities for timber production within a multiple-use context, in

providing security for silvicultural investments into currently immature timber or "not sufficiently restocked" land. There is sufficient flexibility in timber management to accommodate most other interests in the area, using environment protection buffers around the lakes, extending the rotation age to provide older timber types, and by selective logging to maintain a forest cover. A few of the minor access roads constructed for logging or forest management purposes might be physically sealed off during years when they are not required. Rustic facilities can be provided for recreationists, and those which are readily accessible by road can be regularly serviced (to provide firewood and remove garbage). Relatively modest campsite design modifications and servicing could mitigate user-intensity conflicts on more accessible sites in the short term. Physical manipulation of access to the outlying lakes may preserve or restore much of the "wilderness" recreational values, at least for the foreseeable future (5 to 10-year horizon).

Given the capabilities under Forest Act authority to engage forest industry participation in management of forested land, and to otherwise draw upon a large resource base for program implementation, it is probable that the full extent of the recommendations under this option could be achieved.

7.2 PROVINCIAL RECREATION AREA ALTERNATIVE

Designation under the Park Act as a Class "B" Park or Recreation Area would identify the Parks and Outdoor Recreation Division of the Ministry of Lands, Parks and Housing as having primary responsibility for management of lands and all resources in the core area. A Class "B" Park designation places a higher priority on the recreation interests, while a Recreation Area is more completely flexible. Both, however, ensure multiple-use on lands predominantly used for recreation. To accommodate compatible timber and forage harvests, some measure of authority for this purpose could be delegated to the Ministry of Forests (the measure of delegation to be generally determined within implementation policies of this report). Similarly,

fish and wildlife authority may be delegated orreturned to the Ministry of Environment, under some direction. Mineral exploration and mining activity would be possible, but only at the discretion and under control of Park Act authorities. Recreation management could include extensive development of facilities, gated roads for limited-access serviced campsites, regulations to govern public use, and regular supervision and enforcement. These elements would be assembled through a more detailed planning process based on the general direction given in this report.

The Class "B" Park or Recreation Area option could maximize protection of recreation interests while preserving a multiple-use context. It could both maintain the natural capability of the area, and regulate the intensity of recreation use within prescribed limits. It could enable increases in current levels of recreation, while securing a range of recreational opportunities. Staging of implementation, if this option is selected, would be highly dependent on recreation program budgets and priorities determined at the provincial level.

7.3 CLASS "A" PARK ALTERNATIVE

Creating a Class "A" Park over the Roche-Hosli core area would give the recreation interests a virtually exclusive priority. Livestock grazing could be accommodated as an existing commitment, but it would not be possible to accommodate timber harvest. Any mining-related activity would be precluded. The degree of commitment which might be made to facilities, servicing and site management, and supervision and interpretation programs, would be maximized by selecting this alternative. Facilities development and access management would be determined in another stage of planning, on the basis of direction set out in this report. The relative dominance of "wilderness" and "developed" recreation values would be determined in that step, through a park use plan with a public involvement component to ensure recognition of local priorities. As with the previous option, the staging of implementation of this option would be dependent on recreation program budgets during the coming years.

TABLE 6 ALTERNATIVE CONCEPTUAL PLANS: SUMMARY

- APPROXIMATELY HALF OF THE STUDY AREA IS RECOMMENDED FOR A "PROVINCIAL FOREST" DESIGNATION, TO SECURE OPPORTUNITIES FOR TIMBER AND FORAGE MANAGEMENT WITHIN A MULTIPLE-USE CONTEXT
- NO AGRICULTURAL DEVELOPMENT OPPORTUNITIES ARE FORESEEN, DUE TO A LACK OF LAND CAPABILITY (THE HIGHEST AGRICULTURAL USE IS LIVESTOCK GRAZING)
- EXPANSION OF SETTLEMENT AND COMMERCIAL USES ON CROWN LANDS IN THE STUDY AREA IS UNDESIRABLE, AND IS NOT PROVIDED FOR IN ANY ALTERNATIVE

# 1 TIMBER AND FORAGE MULTIPLE-USE CORE AREA PROVINCIAL FOREST	# 2 RECREATION MULTIPLE-USE CORE AREA CLASS "B" PARK OR RECREATION AREA	# 3 RECREATION DEVELOPMENT CORE AREA CLASS "A" PROVINCIAL PARK
-MAXIMIZES OPPORTUNITIES FOR TIMBER AND FORAGE MANAGEMENT, WITHIN A MULTIPLE-USE CONTEXT	-MAXIMIZES OPPORTUNITIES FOR RECREATION MANAGEMENT, WITHIN A MULTIPLE-USE CONTEXT	-MAXIMIZES OPPORTUNITIES FOR RECREATION MANAGEMENT AS A VIRTUALLY EXCLUSIVE PRIORITY
-EXISTING TIMBER AND FORAGE INTERESTS FULLY PROTECTED, WITH POTENTIAL FOR ENHANCEMENT	-EXISTING TIMBER AND FORAGE INTERESTS PROTECTED; LIMITED POTENTIAL FOR ENHANCEMENT	-EXISTING FORAGE INTERESTS CAN BE PROTECTED; TIMBER INTERESTS FORFEITED
-POTENTIAL FOR REHABILITATION AND PROTECTION OF "WILDERNESS" FISHING VALUES ON OUTLYING LAKES; POTENTIAL FOR REDUCTION OF USER CONFLICTS	-SIGNIFICANT OPPORTUNITIES FOR ENHANCEMENT OF VARIETY, QUALITY AND USE OF RECREATION VALUES; POTENTIAL TO MINIMIZE USER CONFLICTS	-MAXIMIZES OPPORTUNITIES FOR ENHANCEMENT OF RECREATIONAL OPPORTUNITIES; POTENTIAL TO MINIMIZE RECREATION CONFLICTS
-MANAGEMENT OF TIMBER, FORAGE AND RECREATION ALL DIRECTLY UNDER MINISTRY OF FORESTS JURISDICTION	-MANAGEMENT OF TIMBER, FORAGE AND OTHER RESOURCES DELEGATED TO SPECIFIC MINISTRIES ON THE BASIS OF OPERATIONAL PLANS	-MANAGEMENT OF RESOURCES DIRECTLY UNDER PARK ACT JURISDICTION
-PLANNING OF RECREATION DEVELOPMENT AND MANAGEMENT TO BE UNDERTAKEN IN A SEPARATE PROCESS	-PLANNING OF RECREATION DEVELOPMENT AND MANAGEMENT TO BE UNDERTAKEN IN A SEPARATE PROCESS	-PLANNING OF RECREATION DEVELOPMENT AND MANAGEMENT TO BE UNDERTAKEN IN A SEPARATE PROCESS
-IMPLEMENTATION OF MANAGEMENT PRESCRIPTIONS UNLIKELY TO BE DELAYED OR INCOMPLETE	-IMPLEMENTATION OF MANAGEMENT PRESCRIPTIONS SUBJECT TO BUDGET RESTRAINT AND PROVINCIAL RECREATION PRIORITIES	-IMPLEMENTATION OF MANAGEMENT PRESCRIPTIONS SUBJECT TO BUDGET RESTRAINT AND PROVINCIAL RECREATION PRIORITIES

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MAP No.11 - UPPER BLEEKER CREEK WATERSHED "CORE" AREA

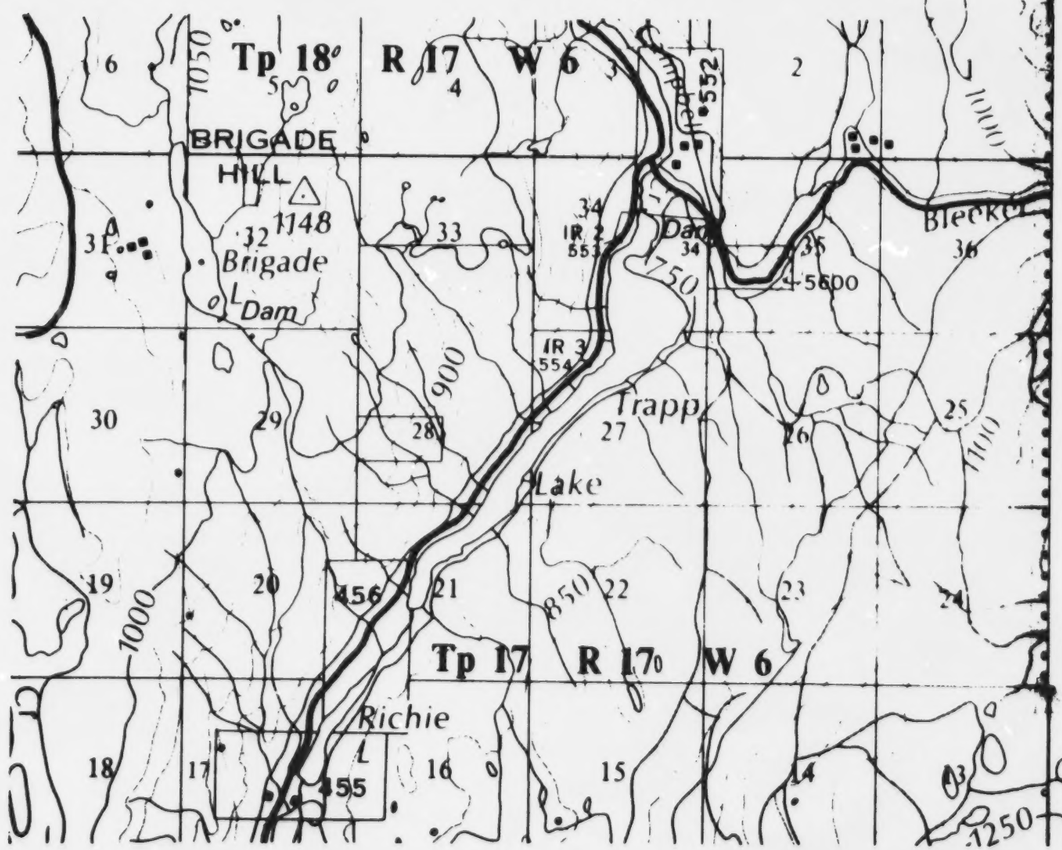
POTENTIAL RECREATION DESIGNATION

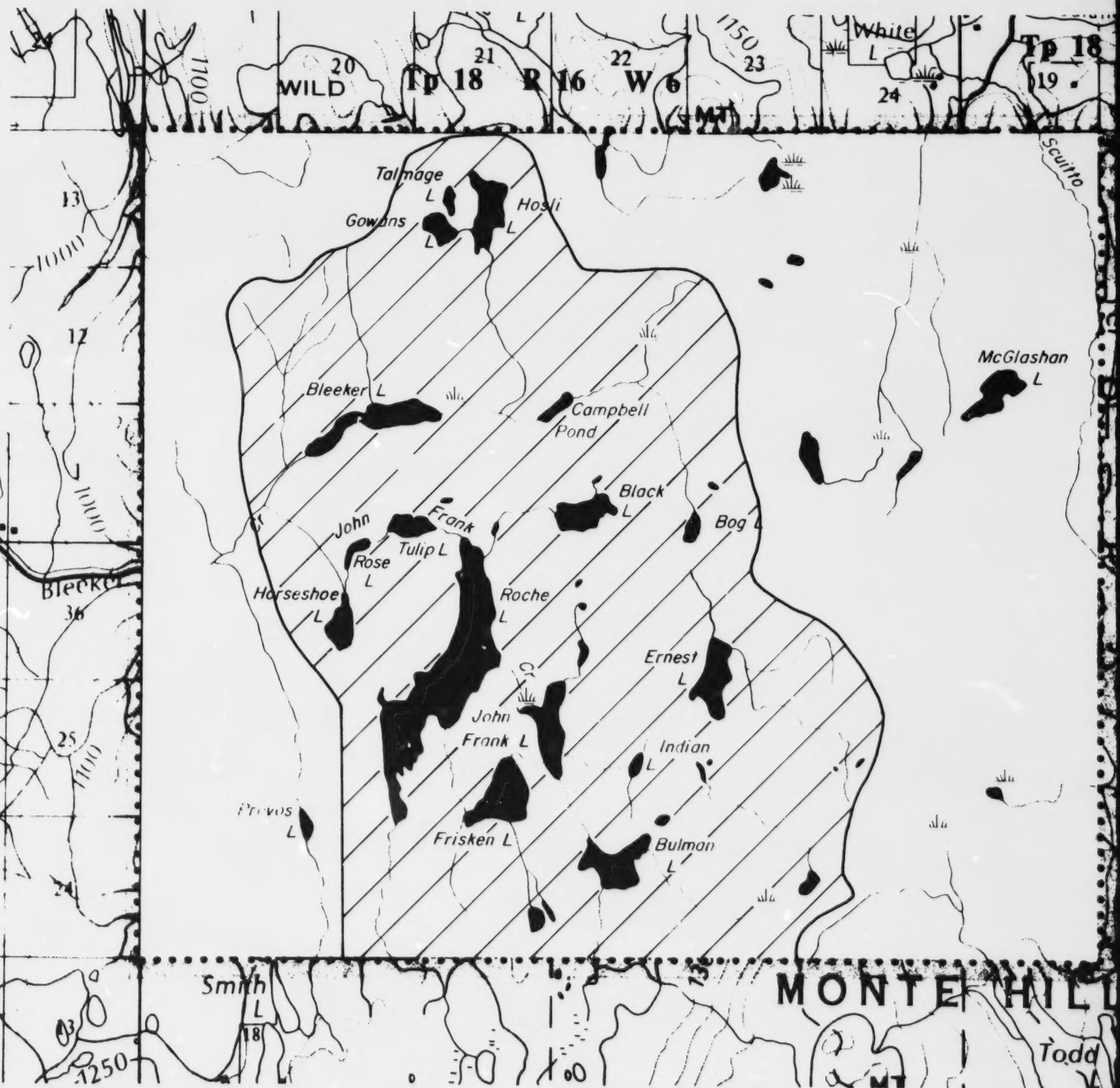
PROVINCIAL FOREST

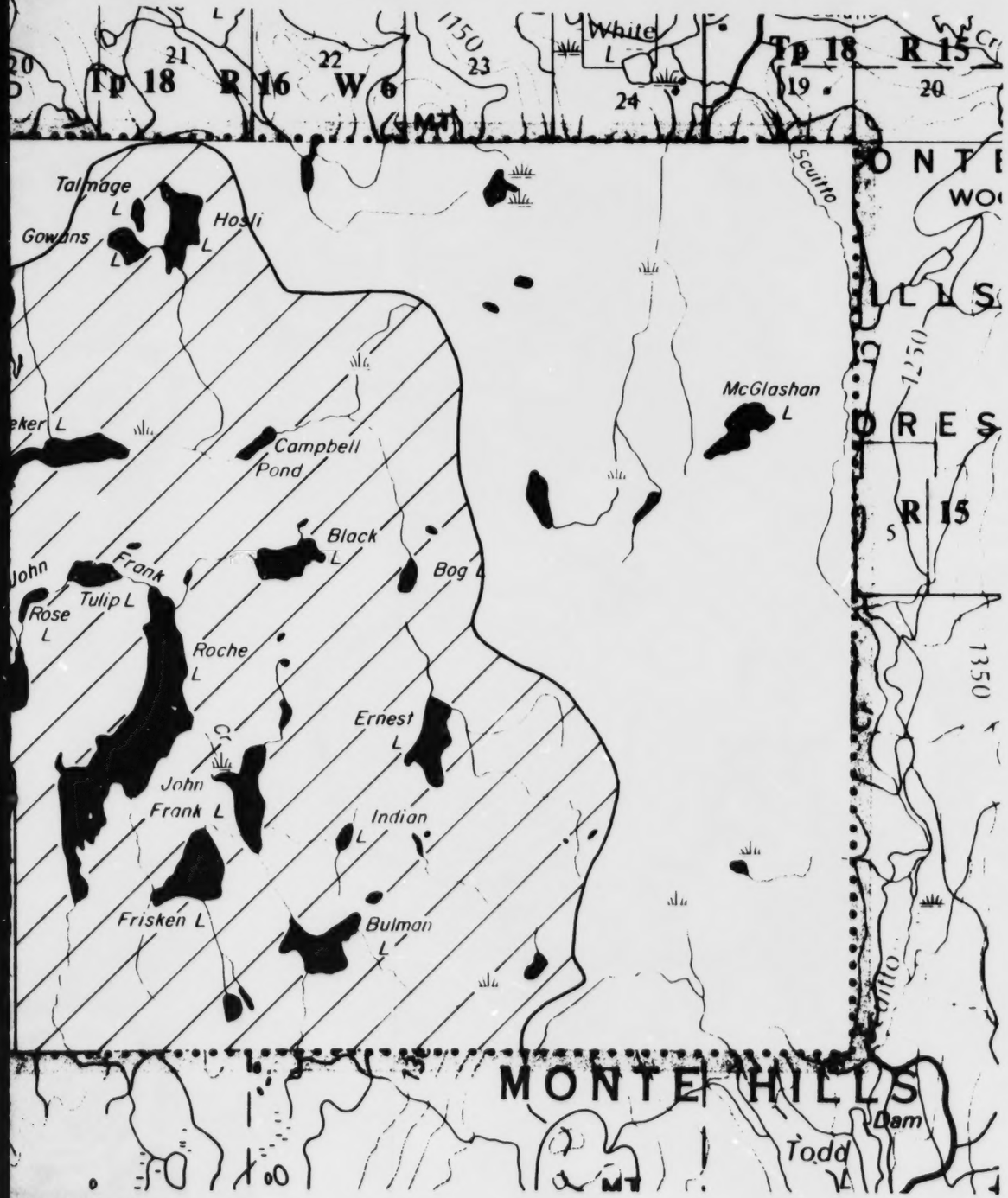
Note Private lands included will not be bound by policies or provisions of the Crown Land Planning Report

SCALE 1:50,000

Metres 000 1000 2000 4000 6000







PART 8.0 SELECTION OF A PREFERRED CONCEPT

8.1 MANAGEMENT CRITERIA

Prior to making a decision on involvement of the general public in consideration of options, or debating the relative merits of Park Act and Forest Act mandates, the planning team undertook a second level of analysis focussing on resolution of the management problems noted. This exercise considered the key or critical elements of an action prescription. Initially, resource-activity sectors were identified. In order to produce guidelines for action in each sector, and to form a compatible set of statements of primary management needs, some basic questions were asked for each sector as outlined below:

Resource-Activity Sectors	Questions
timber - logging forage - grazing water consumption & quality recreation minerals	What level of management? To what general effect or purpose? What relationships or priorities?

In applying the questions above to the identified sectors, the planning team considered a range of scenarios. The thinking process is illustrated briefly in the two examples following:

e.g. 1 The recreation sector in the upper Bleeker Creek watershed is primarily concerned with fish and fishing, and wildlife and hunting/nature study. It also includes camping, motorcycling, skiing and other recreational activities which occur on the land.

- Recreation can be accommodated while being influenced indirectly, by conserving and replenishing recreational resources and by providing for access or facilities construction.
- Recreation intensity can be reduced, maintained or increased, over all or part of an area, by regulating the recreational activities directly and by managing

and limiting access and facilities.

- It is possible to affect the kind of recreation activities occurring in an area, and also in that way influence their impact on other interests using the means identified in the previous point.

e.g. 2 The forage-grazing sector includes forage, grazing by domestic livestock, and fences, gates, cattleguards, corrals and watering developments constructed for management purposes.

- Grazing can be managed to make the most efficient use of the natural forage-producing capability of the land, or managed with minor reductions from the optimum to accommodate other not-totally-compatible interests, or managed with major reductions from the optimum in order to maximize benefits in other sectors.

  Note: The Bleeker Creek Coordinated Resource Management Plan, which covers most of the study area, was recognized as a process designed to achieve efficient use of the forage within limits identified through interaction with other users.

A consensus emerged that the following goals, objectives, actions or assurances are basic to the public interest in the upper Bleeker Creek watershed:

Recreation Sector

- manage the area predominantly for outdoor recreation, with emphasis on the lower intensity or "wilderness" opportunities
- prepare a detailed land-use plan having a recreation management emphasis (The Management Plan) with input from the resource-use representatives which may be affected, prior to any expansion or improvement in the facilities and access system

- provide and protect a range of fishing opportunities and opportunities for wildlife enjoyment
- limit locations where camping is permitted and duration of occupation by individuals in accordance with The Management Plan
- manage access through specified road and trail standards, and by regulating vehicle use under certain conditions and in various locations in accordance with The Management Plan

Forage-Grazing Sector

- preserve the current number of A.U.M.s permitted
- encourage increases in forage production (and A.U.M.s) within the context of The Management Plan
- preserve the Coordinated Resource Management Planning process, and provide for input by the C.R.M.P. committee into The Management Plan

Timber-Logging Sector

- provide for such timber harvesting as may be compatible with other interests
- provide that intensive forestry may be practiced where it is consistent with The Management Plan
- manage timber in some areas to reflect a forage production priority

Water Consumption & Quality Sector

- make no further consumptive demands on surface water
- ensure efficient use of the watershed
- regulate water storage or diversion to recognize or enhance recreation opportunities, within limits imposed by existing commitments
- protect water quality from further waste discharges

Mineral Exploration & Development Sector

- acceptable only using methods which are not detrimental to the other interests noted

This consensus supports the intent and accomplishments of other levels of planning and management undertaken during the last 5 years. It

also addresses deficiencies in current management, to contend with the problems associated with increasing public use.

8.2 ADMINISTRATIVE CONSIDERATIONS

Following identification of management criteria, the task force reviewed and debated in detail the similarities and differences between forest legislation and park legislation currently in existence in the province, with attention also to programs and policies in effect under that legislation. The more significant points which emerged relevant to the issues in the upper Bleeker Creek watershed were as follows:

- The forest legislation focusses on the designation and management of lands within Provincial Forests, where the predominant purpose is advanced as producing tree and forage crops. Management integrates and coordinates other compatible forest uses. Whereas the forest legislation does not convey administrative authority over resources other than timber and forage, there is a statutory responsibility to consider fisheries, wildlife, water, recreation, and other natural resource values, and the economic and social benefits they may confer to the Province. It is noted that the planning policies of the Ministry of Forests provide for recognition of predominant forest values other than timber and forage in instruction to its managers.
- The parkland legislation is concerned with the designation of provincially significant natural or historic areas, where the predominant purpose is public recreation, education and enjoyment. The Parks and Outdoor Recreation Division of the Ministry of Lands, Parks and Housing is responsible for management and administration of all resources (except water) within areas designated under the Park Act. It is also responsible in such areas for management and administration of public and private use or conduct, to whatever degree is necessary to serve the specific intent of the parkland designation. The intent can be exclusively

recreation (Class A Park), priority recreation (Class B Park), or it can recognize recreation only as a predominant use (Recreation Area).

- The forest legislation can be used to designate sites for forest recreation in areas where timber or forage licencees/ permittees are not present or do not object. Rules may be made with respect to public use of these sites. Policy has dictated that these sites are developed on a rustic theme, with minimum terrain modification and facility replacement. These sites are frequently located where timber management has provided the forest access.
- The parkland legislation can be applied over intensively used small sites or large wilderness areas, or sites and areas of any size and use-intensity between. Where multiple-use is desired, legislation and policy provide for administrative authority to be delegated under direction to more specifically-oriented legislation, e.g. the Range Act, the Forest Act, the Wildlife Act.

It appears that either the forest or the park legislation might be used to create a system of serviced campsites and other facilities within the upper Bleeker Creek watershed, as might be called for in a management plan. Control of camping or access outside of designated campsites, however, is not currently possible under the forest legislation, although legal action might be taken against individuals where trespass timber cutting can be proven. Discouragement of access and camping by physical barriers alone, which may be possible under the forest legislation, tends to be ineffective in high-demand areas due to the frequency of assaults by off-highway recreational vehicles. It appears that a general policy of designating forest recreation sites of a larger size in order to combat these problems is perceived at this time by the Ministry of Forests and by industry as presenting serious administrative conflicts with timber and range harvest.

Both forest and parkland legislation incorporate an obligation to

undertake planning. Forest planning considers recreation and other forest values in the context of timber and forage harvests. It incorporates a recreation program, i.e. accommodating the interests and needs of people who penetrate the forest on the logging access system, and maintaining sites and roads affected as a consequence of that use. Parkland planning provides for identification of a suitable level of recreation, and direct management of all aspects of land, resources and use necessary to maintain that level. Other desirable or compatible uses may be accommodated as required.

8.3 SYNTHESIS

It is the opinion of the planning team that the upper Bleeker Creek watershed should remain as a multiple use area. Recreation should receive management emphasis, with livestock grazing as a highly compatible subsidiary use, and a significant level of timber harvesting. Considering the three options identified in the concept section of this report, the Class "A" Park option is eliminated because of the degree of multiple-use desired.

Of the options remaining, both the Class "B" Park and the Provincial Forest concepts may place a higher priority on one area of interest than is either desirable or appropriate considering the management criteria identified. In one instance there may be insufficient provision for forest harvest, and in the other the predominance of the harvest interest may compromise recreation values. A process of elimination based on that point would select the Provincial Recreation Area concept. There are, however, some concerns.

The Park Act appears to offer a strong statutory base for integration of competing resource interests in multiple-use areas, through consolidation of management authority. While recreation is recognized as predominant in Park Act designated areas, recreation planning is dependant on successful integration of all resource interests. The Park Act allows for the various resource interests to participate in plan implementation, through delegation of management

responsibilities. The breadth of authority over resources however, and the policy if not statutory bias toward recreation, leaves the timber and livestock industry representatives on the planning team with some reservations. The observed development style in many existing parks gives the recreation interests similar doubts.

The Forest Act offers a base for integration of competing resource interests, in obliging the timber and range managers to consider such interests in their operational decision-making. There is an incentive for representatives of other forest resource values to make their concerns known, given the potential impact posed by logging or livestock grazing. The Forest Act has achieved some notable successes in integrative management through its public involvement program, although the other interests are often perceived to be in a defensive position in the face of impending harvesting operations. The harvesting operations are not directly dependant on the successful integration of resource management considerations, and there is no effective assembly or delegation of component resource management authority. Recreation programs have to date produced an abundance of relatively small and rustic sites of a sort which would be eminently compatible with the desired character of the upper Bleeker Creek watershed as indicated by the foregoing management criteria. Concern emerges in that there has been no demonstrated capability to control the volume of use on those sites. Further, there does not appear to be any policy on access construction or control related specifically to recreation management.

It does appear that the comprehensive management of recreation access is an important or critical ingredient in achieving the identified management goals in at least one sector. Damage to the access system and to land occurs where recreationists make their own sites and trails, and the simple increase in human activity occurring in the absence of effectively imposed limits can preclude realization of many natural resource values. This is equally important to interests in the forage-grazing sector as it is to the achievement of recreation goals, and it is of concern as well to timber and water interests.

The comprehensive management of access is at present available only under the Park Act Recreation Area option.

Considering the traditional emphasis on timber and forage crops under Provincial Forest administration, and given also that the comprehensive management of access does not appear to be available under that option, the planning team is obliged to consider that the Provincial Recreation Area has emerged dominant from the analysis. While that represents a consensus, the reservations previously noted are significant and warrant one further look at the report's findings, as follows:

The unreserved consensus of the planning team - serving all interests represented - exists on the need for direct management of the recreating public in the total area of the upper Bleeker Creek watershed. The low intensity style of recreation development and the multiple-use programs which would accompany a Provincial Forest designation might be attractive if they could be maintained, but it does not appear that they can. The Ministry of Forests has had responsibility for the Roche Lake area for more than 10 years. It has been unable to control the rising use intensity and consequent degradation at recreation sites in this and other areas. The Ministry of Forests apparently lacks clear direction to plan and manage for recreation where recreation has been identified through planning policies as the predominant use, and it is unable to control the influx of people into sensitive areas.

The choice of an administrative option, therefore, is strongly influenced by the apparent lack of certain management capabilities in forest legislation and policy. Before a Park Act Recreation Area will have the support of the planning team, specific provisions or caveats are required to secure both the "wilderness" recreation values and the forage and timber harvesting components to the degree stated in the management criteria section.

PART 9.0 PUBLIC INVOLVEMENT

The planning task force supports the principle of public involvement in planning the management and administration of public lands. In the case of the Roche-McGlashan area, the task force includes members of industry groups and representatives from organized recreation clubs, thus ensuring a degree of direct public participation.

Provisions for involvement of the general public will be desirable before operational decisions are made which may restrict or lead to development of specific parts of the upper Bleeker Creek watershed "core" area. The choice at a conceptual level, however, has narrowed to such a degree that further documentation of the public interest is unwarranted at this time. Public sentiment with respect to the form management should take has been stated and confirmed in planning undertaken by other agencies and organizations referenced in this report. The only area in which the achievement of a consensus is encountering difficulties has to do with the question of administrative authority, not with management per se. It is the opinion of the planning team that it would not be appropriate for them to take such a limited question to the public at this time.

PART 10.0 IMPLICATIONS OF THE CHOICE OF OPTIONS

The Parks and Outdoor Recreation Division of the Ministry of Lands, Parks and Housing estimates a budget of $50,000 to $60,000 annually for maintenance and control costs in an upper Bleeker Creek Recreation Area. Approximately $150,000 may be required initially for road improvements and campsite construction. Both figures, and the latter one particularly, are highly tentative. The actual investments to be made would depend on the outcome of operational planning yet to be undertaken. Both the management and construction estimates are sufficiently reliable for the present purposes however, as they are based on costs for management in similar situations elsewhere in the region (Kentucky-Aileen Lakes and the Silver Star Recreation Areas).

If the Provincial Forest option were selected, costs initially may be about one-third of those estimated above (due to simpler or more rustic design of campsites). A recreation management proposal drafted in 1979 by the Ministry of Forests Recreation Branch put construction costs in the order of $40,000 to $50,000. Maintenance costs, even with a considerably de-emphasized control component from that possible in a Recreation Area, would still be considerable.

From a resource harvests perspective, there should be no significant reduction of current A.U.M.s of forage produced for livestock grazing under either the Park Act or Forest Act option. There may, of course, be changes required in some aspects of the grazing system regardless of what designation is chosen. Hunting should continue to be available over much of the area, and the principal recreation purpose of the watershed is recognized as oriented toward sport fishing.

On the subject of timber harvest, while a portion of the upper Bleeker Creek watershed is in the existing Provincial Forest, there are no current licencees which might be affected by its removal. Further, the current management of Provincial Forests provides for special treatment limiting harvest of timber on recreation sites and in environment protection areas (E.P.A.s). If the upper Bleeker Creek

watershed were placed under a Provincial Forest designation, it is assumed on the basis of current mapping that approximately 620 ha or 12 percent of the watershed might be included in E.P.A.s. A number of recreation sites would likely be located within those E.P.A.s, on the various lakes. Recreation sites are not subject to forest harvest directly, but they have traditionally been moved from time-to-time in order to facilitate harvest of all of the timber in any given forest. The timber in E.P.A.s is subject to harvest, but it may be on a longer cycle or using different methods of logging (e.g. faller selection) than in other areas.

Under a Park Act Recreation Area designation, the subtle change in emphasis from that of Provincial Forest would likely have some effect on the amount and timing of timber harvest. The upper Bleeker Creek watershed as mapped contains about 5180 ha: about half of the study area. Taking the hypothetical extreme case that the timber in the aforementioned E.P.A.s within the watershed might not be logged, this removal from the forest base (on which Annual Allowable Cut is calculated) would represent about 0.1 percent of the 20 year allowable cut from the Kamloops Timber Supply Area. This case is unlikely to be encountered because of the desirability of management of forests in areas which have been previously logged and in areas where silvicultural treatments are necessary to produce the kind of forest environment which is attractive to recreation, livestock and other interests. It is likely, however, that there would be some areas where timber harvest would be deferred for an indefinite period.

If a decision is made to preserve the logging option within the context of a Provincial Forest, this would imply some direct reduction of recreational values. Further, it is assumed that a Forest Recreation Site development and road improvement program would be implemented. To date the Ministry of Forests has resisted implementing such a program, but under current forest legislation and policy it is doubtful that this position can be maintained.

While a recreation program conceived under Forests' current mandate

might overcome the problems being encountered with access deterioration, it would result in increased public use of the area and worsen the already serious level of user-conflict on the lakes and lakeshores. Development alone merely increases the capacity for numbers of recreationists, and directly increases the influx of people. Subsequently, there would be further demand for access and facility improvements. Such a progression must ultimately result in the diversity of recreational experiences currently available being reduced or lost, and the current potential of the area being much reduced if not irrevocably forfeited. Livestock harrassment would increase, as would the incidence of damage to range improvements.

PART 11.0 SUMMARY AND RECOMMENDATION

The Roche-McGlashan area was identified as a candidate area for deferment from Provincial Forest expansion primarily because of increasing problems with resource management, the solution of which might be inconsistent with Provincial Forest jurisdiction.

The area has a history of extensive forage, timber and water storage uses and management over the years has addressed these priorities. However, access improvement about a decade ago, undertaken in response to public complaints, brought the attractive recreational features within less than an hour's travelling time of a population center of 70,000.

Within the lake-studded core of the planning area, the predominant use is now recreation. Water storage, forage and timber, while of undeniable importance, are now subsidiary uses. Management emphasis must be shifted to reflect this situation, if serious degradation of resources is to be avoided. The purpose of the planning process is to determine the most effective way to achieve this shift.

The planning team's analysis can be summarized in the answers to two questions:

1. What specific requirements must be met to ensure successful recreation management?
2. What are the apparent management capabilities of the two candidate ministries, being Forests, and Lands, Parks and Housing?

The group believed that a comparison of the answers to these two questions would point to a final recommendation for resolution of the land use issues which it has identified.

The answers are summarized as follows:

REQUIREMENTS	CAPABILITY	
	PARKS	FORESTS
1. Manage for Multiple-Use	YES Total control, weak on experience	YES Partial control, strong on experience (with a forest/range bias)
2. Clearly designate recreation as the predominant use within the entire upper Bleeker Creek watershed (core area)	YES	NO (under existing policy)
3. Control the intensity of recreational uses in the core area (number of people entering and using a multiple-use area	YES	NO (under existing legislation)
4. Effectively integrate range, timber and wildlife interests into a management plan for the core area	YES (concern: firm direction required)	YES

Therefore, it is the recommendation of the Roche-McGlashan planning team that a Provincial Recreation Area should be established under the Park Act, covering the upper Bleeker Creek watershed as shown on Map 11. The balance of the study area should be designated as Provincial Forest. It is critical, however, in the enactment which establishes the Recreation Area and/or in the policies which govern its administration, that provisions be made for a specific type and level of multiple use, as follows:

1) Regulate and control public recreational activities as necessary for public safety, to protect livestock interests, and to maintain a planned range of recreational opportunities
2) Integrate and continue the management of fish and wildlife resources by the Ministry of Environment, emphasizing a range of sport fishing opportunities which reflect the diversity of interests in that sport

3) Integrate and continue the range management system administered by the Ministry of Forests, to maintain or enhance the current levels of livestock grazing available in the C.R.M.P. area
4) Facilitate efficient management of the watershed for irrigation water supply, providing for maintenance or enhancement of fish, wildlife and related recreational values where possible within existing licence commitments
5) Develop campsites, picnic sites and improved access only in accordance with a comprehensive management plan for land and resources within the watershed
6) Accommodate the maximum level of timber harvest which might enhance, or at least will not detract from recreation and grazing values

A minor adjustment to the existing Monte Hills Forest will be required for implementation to proceed. The operational planning for the upper Bleeker Creek Recreation Area should commence immediately upon its establishment under the Park Act, and should be completed within two years of that date. In the period prior to the plan completion, significant decisions should be routed through an inter-agency committee. The planning process should incorporate public involvement through direct participation of the major user groups, and the recommendations should receive endorsement at Regional Resource Management Committee prior to implementation.

ROCHE-MCGLASHAN DEFERRED AREA
CROWN LAND PLANNING REPORT

APPENDIX I

ROCHE-MCGLASHAN TASK FORCE
PARTICIPANTS

ROCHE-MCGLASHAN TASK FORCE
PARTICIPANTS

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R. Frolek, Frolek Cattle Co., Knutsford (landowner)

ROCHE-MCGLASHAN DEFERRED AREA
CROWN LAND PLANNING REPORT

APPENDIX II

RESOURCE AND LAND-USE INVENTORY DETAIL

5.1 LAND FOR RECREATION (Inventory Map 4)

A combination of natural features and accessibility make the Roche-McGlashan area uniquely attractive for a diversity of outdoor recreation activities. The relatively open forests of Douglas fir and the scattered openings give a park-like appearance, and the aggregation of small and productive lakes provide an array of different, high-quality sportfishing experiences within a relatively small area (see Section 5.3, Fish and Wildlife). The area is one of the premiere fishing spots in the interior of British Columbia, and in the province as a whole. While it is located within a half hour drive of a major interior city, and many of the natural values have been severely diminished by logging practices which would not be permitted in the area today, the character of the land remains one of relative isolation.

Recreational access is primarily by Highway 5 south of Kamloops, turning east between Shumway and Trapp Lakes and thence about 8 km by good all-weather gravel road to the north end of Roche Lake. At the end of the good road, this is by far the predominant use-area. An extensive system of old logging roads and a transmission line access trail provide rough access to a dozen other smaller lakes in the vicinity.

User surveys conducted by the Ministry of Forests during 1979 and 1980 indicate that fishing is by far the greatest attraction to the area, with over 95% of visitors identifying this as the main reason for their visit. Estimated use of sites maintained by the Ministry of Forests on Roche Lake, based on visitor interviews by maintenance staff, was 11,136 user-days during May to October of 1980. Whereas records were not made for 1981, the increase in use recorded on another popular location just north of Kamloops (Heffley Lake: 6271 visitations in 1980 and 7836 in 1981) may allow extrapolation to approximately 14,000 user-days provided by the Roche Lake sites during the same period in 1981. This represents only a portion of the use of the total watershed, given other lakes and unserviced sites available.

The heaviest activity occurs in late spring/early summer and in late summer/early fall which coincides with the best fishing. Camping is significant, with about 97 percent of the users surveyed staying overnight, and over half of those people staying in the area for 3 to 5 days. Other recreational activities represented include hiking, rock-climbing, canoeing, picnicking, swimming, trail biking, photography, hunting, cross-country skiing, snowmobiling, and relaxing. Local use has traditionally accounted for about half of the visitors to the area, with all other visitors (other British Columbia, Canadian and international) making up the other half. In the past three years, however, local use has been declining while visitation from the rest of British Columbia, especially the lower mainland, has increased.

The natural variation between the different lakes - in size and shape, in water clarity/colour and bottom cover, in water depth, and in shoreline vegetation - provides an array of opportunities which might appeal to virtually every personal preference. There is increasing conflict evident however, between "wilderness" purists and interests in more "urban" or mechanized forms of recreation. This conflict is not unique to the Roche-McGlashan area, but the area is one of the more significant trouble spots in the Thompson-Okanagan Region because of the intense competition for its rich but limited resources.

The conflicts cover a considerable range: Visitors to the area wanting to relax in a quiet lakeside setting are irritated by the roar of trail bikes and outboard motors, and loud music or lakeshore parties. Dogs wandering loose amongst the campsites represent not only a nuisance but a hazard to campers and wildlife. Bears are being attracted to the area by the availability of garbage. The discharge of firearms in areas of high human activity or over water represents a significant and growing danger. The area lacks any form of sani-station, and sewage and detergent wastes are being dumped onto the ground close to the lake: the soils are relatively thin and the effluent rather quickly makes its way into the water to produce disturbing stains and odours and a possible long-term concern for the

fishery. Litter and garbage are barely under control at present; this on the outlying lakes largely due to the individual efforts of local sportsmen.

Perhaps the three most obvious problems to Kamloops residents are the degree of crowding at the access points (which often precludes day-use or renders the sites undesirable to local fishermen), the devastation wrought on the dirt roads by heavy use during the wet early season, and the crowding on the lakes themselves where there is often no longer enough room for both the fly fishermen and the trollers to pursue their differing styles.

5.1.1 Recreation Management: Development and Maintenance

There are currently nine designated recreation sites in the Roche-McGlashan area: four within the Monte Hills Provincial Forest and five outside of it. Seven of these are undeveloped and unserviced, while the other two are maintained by the Ministry of Forests. There is also a commercial "resort" (time-share) on the lake which provides some opportunities for public recreation.

The two maintained public sites in the area are both on Roche Lake. The major one - on the northeast corner - has minimal facility development with four pit toilets and a few garbage barrels being provided. Access is via an all-weather graded gravel road. The area would have a carrying capacity of about 25-30 parties if efficiently organized, but there are no control mechanisms for the location of this use or for limiting numbers. Use spreads down the lakeshore and into the trees alongside the road. The area is occupied to capacity and well beyond in the peak fishing season. A problem with pre-emptions has been noted: individuals leaving their mobile homes on the area for most of the summer. The other maintained site is on the west side of Roche Lake. Access to it is considerably rougher than for the first one described. There are garbage barrels and two pit privies, and the area can accommodate up to about 12 parties. It is only occasionally used to capacity, clearly because of access problems.

The other sites where land has been formally protected for recreation, but with no facilities or regular maintenance, are

a) Frolek (Tulip) Lake - U.R.E.P. Reserve - roadside, no screening, small capacity (1-2 parties)
b) Bleeker Lake - U.R.E.P. Reserve - easy access, south-facing meadow and open forest bisected by road paralleling lakeshore, large capacity
c) Hosli Lake - U.R.E.P. Reserve - difficult access (road conditions),semi-open forest, moderate capacity (5-7 parties)
d) Bulman Lake - Forest Act - difficult access (road conditions), grassland and semi-open forest, major capacity
e) Friskin Lake - Forest Act - difficult access (road conditions), grassland and semi-open forest, moderate capacity
f) Black Lake - easy access, small capacity
g) McGlashan Lake - Forest Act - very difficult access (not accessable from Roche Lake area), forested site, moderate capacity

There are additional sites, both on the above-mentioned lakes and on the others in the system. These other sites are often used by persons seeking room away from the more crowded conditions at Roche Lake, or simply seeking the different fishing experiences or scenic/natural values available. These sites are generally situated amongst the trees in a closed-canopy forest, and as with most of those mentioned previously are accessible only by four-wheel drive or similar-purpose vehicles. There is limited parking and no facilities, and maintenance is an increasing problem.

The commercial resort within the study area is located on the east side of Roche Lake, and is currently expanding/changing its operation. It is located on private land, and has developed from a campground-oriented facility to a lodge-restaurant-cabin complex. Only 12 of the original 27 campsites are being maintained, and 17 new duplexes are being constructed (each unit designed for 4 persons). These new cabins will be reserved for the shareholders of the operation throughout the year, although the shareholders may opt to make their units available for rental to the general public through the resort operation.

With the expanded resort operation and the continued concentration of use of the public site on the northeast side of Roche Lake, crowding in this part of the system is expected to become even more extreme. There is the possibility of directing some of this pressure to the other lakes in the system through facility development and road improvement, but only at the risk of degrading their values as well: spreading the problems of crowding and conflicting recreation styles. Existing demand and demand growth are such that the development of better access and facilities on other lakes may well not relieve crowding on Roche Lake at all, at least not without other forms of management intervention.

What values remain on the outlying lakes are largely due to the rough condition of the roads (a product of attempts at access in wet weather). The growing regional population, and other indicators like the planned Coquihalla Highway indicate that the management of access and other forms of regulation will soon become necessary whether roads/facilities are improved or not, if the recreation values currently in existence in the other lakes are to be maintained. This will become instantly critical if the roads and facilities are deliberately improved to accommodate a broader cross-section of public demand.

5.1.2 Recreation Management: Regulation

Managing access to the lakes in the system has been suggested as a possible means of effecting a level of control on the overloading of campsites (Kamloops Flyfishers, 1976). The management of access can be undertaken by either physically sealing certain roads off at a prescribed distance from the recreation destination (for walk-in day-use from an established parking lot or campsite), or by regulating public entry onto the roads. This last possibility would carry with it the necessity of a high commitment in staff resources.

Other kinds of direct regulation are available, and have been used to some degree in the area: designating waters for special fisheries or restricting the use of power-boats. The enforced separation of fly fishermen from trollers where a high intensity of use and a high

potential for conflict is in evidence may take place in more locations as demands increase, under the authority of the Fish and Wildlife Branch. Similarly, there are restrictions which could be employed under the Provincial Boating Regulations to limit either speed or the type or the size of motors used to propel watercraft, on the lakes in the system. The prospect of water skiing, hydroplane racing or similar activity on high-quality fishing lakes will be of increasing concern as the recreating population in the region rises. The discharge of firearms is of similar concern, and can be regulated under either the Firearms Act or an array of other legislation as necessary.

All of the above are management devices which may seem to be quite independent from designations of land. There is an inter-relationship, however, since designations of land can provide the necessary authority and guiding principles for cooperative action and commitments of staff or other resources which are key to effective management.

5.2 LAND FOR FISH AND WILDLIFE (Inventory Map 5)

The Roche-McGlashan area supports a considerable fish and wildlife resource, and the demand for its maintenance and management constitutes a considerable demand on the land base. Conspicuous and common mammals include moose, mule deer, black bear, coyote, beaver, muskrat, red squirrel and varying hare. Lynx, bobcat and cougar are present in smaller numbers. Bird life includes waterfowl in moderate abundance, shorebirds, raptors, grouse, and a wide variety of passerine birds. With good to excellent access to a large part of the study area, and given its proximity to Kamloops, hunting effort is high with relatively low success rates. The area attracts few bird-watchers, possibly because previous logging practices have degraded the area from an aesthetic viewpoint.

The wildlife resources of the area are heavily dependent on the wetland and riparian habitats, which have been severely affected in

the past by logging, livestock grazing, road construction, and water level manipulations for irrigation storage. Aspen stands on the uplands are important food-producing areas for a diversity of wildlife species, and forest management practices aimed at conversion to conifers are therefore a source of concern. Most of the old growth fir stands in the area have been removed, and at least some of those remaining are critical as winter shelter areas and as nesting habitat for certain bird species. Areas in regeneration after fire or logging consist in the main of very dense stands of young trees - rather poor habitats for wildlife - and thinning would be beneficial to wildlife and to forest production.

Wildlife management problems include the past degradation of deer winter ranges through logging of shelter belts, relatively easy access rendering much of the area unattractive both to wildlife and to wildlife viewers or hunters, illegal hunting, and black bear populations being held below optimum numbers by controlled shooting to protect recreationists. Generally, hunting regulations for Wildlife Management Unit 3-20, of which this area is part, have been adequate to maintain wildlife populations only slightly below optimum numbers for the habitat available. Habitat management and improvement investments for bird and mammal species are being made on the water bodies and riparian habitats through Ducks Unlimited projects (associated with water licence administration, see Sec 5.5). Indirect but still major investments have been made in improving upland habitats through contributions to Coordinated Resource Management Plans, Folios, and others undertaken by the Ministry of Forests.

The study area is best noted for its fisheries resource, which is significant in both a regional and provincial context. With the exception of McGlashan Lake, which is tributary to the Campbell Creek system downstream, the area's lakes all reach Campbell Creek by way of Bleeker Creek. Roche Lake is the main lake in the Bleeker Creek watershed and has been the major focus of the sport fishery, but Bleeker, Black, Hosli, Ernest, John Frank, Bulman, Friskin, Horseshoe, Rose and Tulip Lakes are also notable for their fisheries values. The

sport fishery was established in these lakes after treatment with toxiphene in 1962 to remove undesirable species; the lakes were restocked with trout the following year. Most of these lakes are so high in productivity and shallow in depth that they "winterkill" (oxygen depletion under ice cover). The productivity, however, allows such excellent growth that whenever a winterkill does not happen they can produce extremely large fish in a relatively short time. The lakes are all subject to constant efforts to prevent their winter oxygen depletion.

An attempt is being made, to the extent of authority within the Fish and Wildlife Branch, to manage the Roche group of lakes for a different recreational experience on each satellite lake (with a central focus on Roche Lake itself). Management by this agency and participating private organizations relies generally on direct manipulations of the resource by regulation of gear, seasons, catch limits, and stocking rates. Recent efforts have included habitat management with small dams and aeration compressors. The total management of the watershed to embrace access, visual-aesthetic and forest hydrology concerns is essential however, if even current demands on fish and wildlife are to be met. An inventory of the lakes and current management programs on them is presented in the accompanying Table. Recommendations made over the past several years for a total management system, extracted from the Kamloops Flyfisher's Association Land Use Plan of March 9th, 1976, and from subsequent correspondence by the Fish and Wildlife Branch, B.C. Ministry of Environment, include

- Timber harvest has to date resulted in erosion-siltation, degradation of visual resources and hydrological disruption, and should be halted in the "core" area of the Roche Lake system except as necessary to maintain fishery/recreational values. In the surrounding area, careful attention should be given to integrate fisheries/recreation values in forest harvest plans, particularly in the vicinity of "E" Lakes and McGlashan Lake.

- Land alienations and further subdivision of private land (incl. strata and timeshare) result in exclusive and highly consumptive use of limited resources, and should be prevented absolutely.
- Water allocation has been excessive, and in some cases has worsened water quality and "winterkill" problems in the lakes. No further licences should be issued. Existing storage licences should be assessed and consolidated or otherwise altered where possible, to integrate fishery concerns. (Remedies are being found through cooperative programs in water management, but the concern of over-commitment remains.)
- Livestock grazing has been excessive in some areas and has resulted in erosion/water quality problems. (Remedies are being found through the C.R.M.P. program.)
- Access and facilities problems have resulted in heavy recreation pressure on Roche Lake, with potential in other lakes unused. Access management and limited facilities development (maintaining the "rustic" low-key nature of a wild-land fishing experience) should be undertaken.
- Recreation activities have resulted in nuisance, pollution, erosion, and public safety problems where motor boats have been used on the small lakes, firearms have been discharged in campsites, motorcycles and other all-terrain vehicles have been used indiscriminantly, live trees have been cut for firewood, garbage and sewage wastes have been disposed of inappropriately,and campsites have been monopolized. Regulations to resolve these problems are an immediate necessity.

FISH RESOURCES

LAKE	FISH SPECIES	WINTERKILL	STOCKING RATE	FISHING PRESSURE
Roche	Rainbow	no	65,000/yr.	20,000 days/yr.
	Management Comment - The largest lake (197 ha) in the study area. 1977 stocking rates were producing 2 lb. average fish. As result of complaints (from the commercial fishing camp) of not sufficient numbers, stocking rates were increased yielding an average size of 3/4 lb. A change in management of the fish camp in 1981 will result in increased angling pressure, which will result in further reductions of fish size if catch success per angler is to be maintained. Ice fishing may be prohibited on Roche Lake to reduce the yearly catch (and ice fishing opportunities enhanced on other lakes), and/or catch limits may be reduced to mitigate this decline. Conflict between fly fishermen and trollers have been resolved in part by a prohibition of motor boats on the shallow south end; protection of its relative remoteness required.			
Tulip	Rainbow	yes	2,000/yr.	200+ days/yr.
	Eastern Brook		2,000/yr.	
	Management Comment - A small lake (8 ha) adjacent to the main road, this has particular potential as a winter fishery. Winterkill problem worsened by water level fluctuations (irrigation withdrawals) will be remedied by installation of electrical aerators to replace the pondmills originally put in by the Flyfishing Club.			
Rose	(from Tulip)	severe	none	none
	Management Comment - A small (6 ha) roadside lake. An electrical aerator being installed (1981) will permit realization of excellent potential and support future fish stockings.			
Horseshoe	Eastern Brook	severe	5,000/yr.	?
	Management Comment - The re-establishment of Horseshoe Lake on the outlet stream from Roche Lake - Fish and Wildlife, Ducks Unlimited and Willow Ranch cooperation in the diversion and raising the level of Horseshoe Lake in 1979 - and the installation of an electrical aerator by 1982 is expected to permit significant enhancement of the fishery. Both Rainbow and Eastern Brook trout will be stocked.			
Bleeker	?	severe	yes	500 days/yr.
	Management Comment - A 38 ha lake with drawdown (for irrigation) and quality (sawdust from an old millsite) problems currently precluding significant over winter survival. The windmill aerator will be replaced by an electrical aerator by the fall of 1982, and annual stocking will be increased to sustain a "high numbers" fishery.			
Black	Eastern Brook	yes	6,000/yr.	1,000+ days/yr.
	Management Comment - An 18 ha lake popular for its winter fishery. Fish and Wildlife Branch windmill aerator being replaced with electrical compressor (1981).			

FISH RESOURCES (Cont'd.)

LAKE	FISH SPECIES	WINTERKILL	STOCKING RATE	FISHING PRESSURE
Bog	from Ernest	severe	none	none
	Management Comment - A very small lake with some potential, which might be developed if the lake were aerated to prevent winterkill (no current plans).			
Ernest	Rainbow	minor	5,000/yr.	1,500+ days/yr.
	Management Comment - A 25 ha lake managed by reduced stocking and special regulations as a "Trophy" fishery: exceptionally large fish. Poor access and limited facilities necessary to keep fishing pressure low enough to sustain this fishery.			
John Frank	Rainbow	yes	yes	?
	Management Comment - A small lake with excellent potential for management for large fish if the winterkill problem can be beaten. Pondmills placed by the flyfishing club have had limited success; the current program involves Ducks Unlimited, the Willow Ranch and the Fish and Wildlife Branch contributing to dam construction to increase the lake level (18 inches), and an electrical aerator may be installed.			
Friskin	Rainbow	yes	8,000/yr.	2,000 days/yr.
	Management Comment - A 29 ha lake with considerable potential; efforts to reduce winterkill by aeration will be made in 1982. Encouragement of higher use levels may be necessary to alleviate pressure on Roche Lake.			
Bulman	Rainbow	minor	6,000/yr.	2,000 days/yr.
	Management Comment - A 27 ha lake with capability to sustain more fishing pressure. Has been suggested as a "walk-in" lake.			
Hosli	Rainbow	minor	5,000/yr.	2,000 days/yr.
	Management Comment - "E" Lakes include Gowans and Talmage, but only Hosli (23 ha) sustains a fishery. This lake is accessed from both the Roche Lake area and Barnhartvale. It provides an excellent fishery, which is likely to deteriorate as a consequence of recent access improvements.			
McGlashan	Eastern Brook	?	yes	?
	Management Comment - Provides a significant winter fishery (access principally by snowmobile). Access from Barnhartvale: little relevance to the Roche Lake system.			

5.3 LAND FOR LIVESTOCK GRAZING (Inventory Map 6)

The Roche-McGlashan area includes parts of three grazing management units (Ministry of Forests), within which there are locally significant areas of spring/late-fall livestock range. This rangeland category is critical to the livestock operations; its availability and capacity limits the potential size of the beef cattle herds. The key areas are generally open forests below 1150 m elevation, located predominantly in the western half of the study area. Semi-open and timber-covered ranges at elevations above 1150 m provide forage for summer and early fall grazing. There are no lands in the study area which are of sufficiently low elevation to support more intensive forage crop-agriculture, and other factors such as soil type and water availability are also limiting.

There are a number of grazing permittees (Range Act) currently making use of the forage available in the study area. The level of use and degree of dependence on this forage varies considerably between them (see Table, following page). The Willow Ranch is the major concern (most of the study area is in the Bleeker Lake unit). Its base of operations is adjacent to the western study area boundary, and consists of approximately 2000 deeded hectares with about 135 ha in hay production. It produces approximately 145,000 kg of beef annually. It depends on the Bleeker Lake Unit to supply most of its Crown range needs, and 71% of its permitted use of this unit involves land within the study area (69% and 61% of its critical spring range and fall range, respectively). Calculations on this basis indicate that the study area rangelands are critical to about 2% of the beef production from the Kamloops Forest District.

The value of Crown range in the study area is expressed, in one sense, in the cost of land improvements undertaken to increase its productive capability. Through the cooperative efforts of the Ministry of Forests, the Ministry of Agriculture, Canada Agriculture, and the Willow Ranch, the management of grazing in the Bleeker Lake Unit has been organized under a Coordinated Resource Management Plan. From

LIST OF GRAZING PERMITTEES AND A.U.M.s WITHIN STUDY AREA BY UNIT

Bleeker Lake Unit

1. Permit Holder - N. Gregory - Willow Ranch, 5 year permit expires May 1983, 3502 AUMs Net Annual Use 655 cattle

Season	A.U.M.s in Unit	A.U.M.s in Study Area	Proportion Dependence
Spring	859	573	69%
Summer	1718	1351	79%
Fall	925	565	61%
TOTAL	3502	2489	71%

Wolfe Lake Unit

1. Permit Holder - J.E. & P.J. Hamilton, 5 year permit expires May 1983, 361 AUMs Net Annual Use 90 cattle
2. Permit Holder - J. & G. Gowans, 5 year permit expires May 1983, 220 AUMs Net Annual Use 60 cattle
3. Permit Holder - C.S. & F.G. Hutchinson, 5 year permit expires May 1983, 140 AUMs Net Annual Use 40 cattle
4. Permit Holder - A.M. McLeod, 5 year permit expires April 1983, 100 AUMs Net Annual Use 20 cattle
5. Permit Holder - L.J. Gacomuzi, 5 year permit expires May 1983, 480 AUMs Net Annual Use 120 cattle

Season	A.U.M.s in Unit	A.U.M.s in Study Area	Proportion Dependence
Spring	145	20	14%
Summer	1073	111	10%
Fall	83	11	13%
TOTAL	1301	142	11%

Stump Lake Unit

1. Permit Holder - Wicklow West Holdings Ltd. - 5 year permit expires July 1984, 4179 AUMs Net Annual Use 952 cattle

Season		A.U.M.s in Unit	A.U.M.s in Study Area	Proportion Dependence
Spring	1981	418	28	7%
	1982	488	28	6%
Summer	1981	2261	425	19%
	1982	2924	366	13%
Fall	1981	465	25	5%
	1982	369 +35	30	8%
TOTAL	1981	3179	478	15%
	1982	3816	424	11%

1976 to the end of 1980 a total of $121,384 was spent through the Bleeker Lake C.R.M.P., of which the range user contributed 10% and the Federal and Provincial governments 45% each. These expenditures have created additional fencing and water developments which enable improved grazing distribution over most of the study area. Enhanced control over cattle distribution enables a more efficient use of the Crown forage (avoiding over-use of some areas while others go untouched), thus enabling overall improvement of the range condition for both cattle and wildlife. On the basis of these commitments on the Crown range, a considerable investment of private funds has been made in the livestock operations on adjacent deeded lands. (Willow Ranch indicates approximately $250,000 has been spent to utilize the benefits of the C.R.M.P., with a further equal amount budgeted.)

The value of the Crown range could also be expressed in terms of livestock production. Using the accompanying table, the value might be estimated in terms of the costs of alternatives (an equivalent rate of feed in a feed lot would cost approximately $36.00 per Animal Unit Month). It might also be calculated in terms of the wholesale price for the increase of weight of beef at market, less other production costs. A multiplier effect could be used to estimate indirect benefits, based on either of these approaches. The direct value of beef production on Crown range would include the revenues to the province from grazing permit fees, which in 1981 was $1.41 per A.U.M. While the specific figure which might be derived is not necessarily important to this report, it is relevant that the range values in the study area are considerable.

The popularity of the area for public recreation, concentrating particularly on the Bleeker Lake Unit, has been of considerable concern to the livestock operation. In the absence of the C.R.M.P.-A.R.D.S.A. fencing and water developments, cattle distribution could only be controlled by range riders. Livestock tended to concentrate around the natural waterbodies, which were also popular with fishermen. Encounters between cattle and recreationists made controlled cattle distribution all but impossible. The range

improvements, including special gates and cattle guards specifically to facilitate recreation passage, have considerably reduced this problem. With the increasing recreation use of the study area as a consequence of regional population growth, and with the prospect of further increases resultant from the Coquihalla Highway construction, recreationist-livestock conflicts could again become a major concern.

5.4 LAND FOR TIMBER SUPPLY (Inventory Maps 7, 8 and 9)

Within the Roche-McGlashan area there are portions of existing Timber Sale Harvesting Licences, Timber Sale Licences, and Tree Farm Licences. (Some of the T.S.H.L.s will likely be replaced by Forest Licences under the new forest legislation.)

T.S.H.L.s and Forest Licences are held by major licencees, whereas T.S.L.s exist to supply the needs of smaller operators who do not qualify for major tenures (e.g. local demand for posts and rails). T.S.L.s, T.S.H.L.s, and Forest Licences are commitments of a volume or quota of timber (an Annual Allowable Cut) and may exist for 10 to as long as 20 years in the case of a Forest Licence, with reviews of the A.A.C. every 5 years. There is an incentive for intensive timber management by industry in the provision for increases in A.A.C. on replacement licences. T.S.L.s and T.S.H.L.s are located in the Monte Hills (along the eastern edge of the study area) and to a lesser degree in the south-west and north-west quadrants: generally away from the core of the area and its lakes. Those indicated in the western half of the study area are expired for cutting purposes, but a reforestation commitment remains.

There is a small portion of a Tree Farm Licence (T.F.L.16) projecting into the southeast corner of the study area. T.F.L.s represent a longer term and more absolute commitment than the forms of tenure described above. The term for a T.F.L. is 25 years (renewing every 10). In a T.F.L. the licencee undertakes a major responsibility for management of the forest land base.

Chart Areas are not shown on the map, since they represent only an administrative notation. They come about as a result of interest expressed by a forest licencee, but there is no legal commitment involved. Licences may be issued on Chart Areas (effecting a legal, long-term commitment) or the Annual Allowable Cut may be apportioned by individual cutting permits.

A further indication of recognized "forest" interests is the investment which has been made in Sub-Unit Planning (forest resource planning). The Scuitto Creek Folio and the Bleeker Lake Coordinated Resource Management Plan together include most of the Roche-McGlashan study area. The Scuitto Creek Folio is timber-harvest oriented, and in this case is intended to integrate fish and wildlife interests by prescribing buffer strips around sensitive lakes and meadows and by identifying a portion of the tree cover to be maintained by selective harvesting in sensitive wildlife habitats.

The Bleeker Lake C.R.M.P. presents a management system for a broader range of "forest" resources and resource interests. It is principally a grazing plan, but in improving the distribution of cattle there are significant benefits available in improved wildlife habitat as well. The Bleeker C.R.M.P. is discussed in more detail in sections 5.2 (Wildlife) and 5.3 (Livestock Grazing). With regard to timber interests, the Bleeker C.R.M.P. indicates generally that other resource interests are to be given priority consideration ("to harvest the maximum amount of wood fiber compatible with other resource users"). It also indicates, specifically, that there should be an area around the major fishing lakes where a management emphasis on recreational and aesthetic values is recognized. Past logging practices have caused significant degradation of resource values in this part.

The amount and distribution of existing timber and the capability of the land to produce wood fiber are significant considerations for determining suitability of the land for one or another use. The existing distribution of mature and immature timber in most of the

Roche-McGlashan area is a reflection of past timber harvesting activities. There are extensive areas of virgin timber in the south-western and east-central extremities of the study area. In the remainder, however, with the exception of areas around the north half of Roche Lake and Hosli Lake-westward which have not regenerated, there is a relatively even proportion of mature and immature stands.

Information on the inherent capability of forest land to produce timber can be obtained from species, height and age data. On this basis, forest cover inventory divides growing sites into good, medium, poor, and low site class categories. A numerical value can be assigned for good, medium and poor sites, as the amount of increase in wood fiber per year on one hectare of land for the indigenous tree species. This increase in wood fiber is known as the main annual increment (M.A.I.). The distribution of growing sites by this classification are generally compatible with the British Columbia Land Inventory classification of Land Capability for Forestry. (The B.C.L.I. system is a broader one, based on soil, elevation and climate in addition to considering forest cover, and it is also a useful one for general planning.) Both show moderate to poor growing conditions predominating, with only a few scattered high-quality sites. The better sites are found in the east and south parts of the study area, but tend to be primarily pine and spruce forests rather than the higher-value Douglas fir types.

While it is a relatively simple matter to measure the existing wood volume of merchantable sized trees in place, it is more difficult to predict with accuracy what volume will finally be available, and when, from an immature stand or a denuded area. Projections from M.A.I. values provide a useful approximation.

The volumes of mature timber available, taking into account reductions for deeded land, decay, problem forest types, environment protection areas, and recreation "reserves", are as follows:

- good site class 62,398 m^3 over 309 ha
- medium site class 278,817 m^3 over 2,515 ha

- poor site class 121,465 m^3 over 1,360 ha

for a total of 462,680 m^3 of mature timber over 4,184 ha.

The distribution of immature timber is as follows:

- good site class 42,527 m^3 over 188 ha
- medium site class 170,792 m^3 over 1,144 ha
- poor site class 40,407 m^3 over 1,796 ha

for a total of 3,128 ha. Using the M.A.I. and the areas of immature timber given, and projecting this forest to "rotation" age, represents a crop volume as follows:

- good site class (2.9 m^3/ha/yr x 188 ha x 80 yr) 43,616 m^3
- medium site class (2.1 m^3/ha/yr x 1,144 ha x 80 yr) 192,192 m^3
- poor site class (1.05 m^3/ha/yr x 1,796 ha x 10 yr) 150,864 m^3

for a total of 386,672 m^3 over 3,128 ha available over the next 80 years.

The analysis of timber supply relative to timber demand has been calculated over a much larger area, for the Kamloops Timber Supply Area Report, May 1981, but some figures from that report are relevant. It analyzes the timber supply for the 20 year short term period, and makes projections over the long term period of more than 150 years. The short term analysis indicates that there is a sufficient volume of mature timber in the Kamloops T.S.A. to meet the existing commitment to the licencees of 2,309,870 m^3 per year for the next 20 years. The longer term analysis, using a net land base calculation (incorporating reductions for environmental protection areas, problem forest types, etc.) reveals that the present level of commitment can be maintained for only 80 years before a significant shortfall occurs. Land withdrawals proposed to protect caribou habitat in the northern part of the T.S.A. would result in a predicted 10 to 20 year earlier shortfall. In the Roche-McGlashan area, the volume of existing mature timber and the projected volume of immature timber at rotation age correspond to 1% and 0.8% respectively of the 20 year allowable cut for the Kamloops T.S.A.

5.5 WATER QUANTITY AND QUALITY (Inventory Map 10)

The lands both west and north of the Roche-McGlashan area are heavily committed to forage-crop agriculture, which depends on irrigation from Campbell Creek. The lakes within the planning boundaries constitute a major contribution to that system; particularly via Bleeker Creek which drains the majority of the watershed to Campbell Creek and is itself an important irrigation source (for the Willow Ranch hayfields). The Campbell Creek watershed in general, and this part in particular, is seriously over-subscribed by withdrawals licenced under the Water Act.

Existing storage licences on the lakes, both developed and undeveloped, have been reviewed and work is underway to consolidate and upgrade the storage system. The licencees, Ducks Unlimited, and both Water Management and Fish and Wildlife (of the Ministry of Environment) are cooperatively involved. The continued management/manipulation of the lake-reservoirs in the study area, adhering to a policy of integrative management for multiple benefits, is critical to many public and private interests. It is a major concern that given the already intensive use and management of the water resource, changes in land-use should not be contemplated where they may involve significant demands on water or interfere with reservoir fluctuations. This concern exists not only at the broad land allocation level, but at the operational (management) levels as well. Focal points of public use and the sites of water storage/diversion works are generally not compatible, and vandalism can be a serious problem.

Water quality is an issue in the study area primarily because of the importance of the sport fishery. Any deterioration in water quality, such as an increase in nutrients and organic loading, would worsen the already difficult winterkill problem as well as detracting from the aesthetic qualities of the system. Experience has shown that land development can cause immediate changes in both water quality and existing biological communities. It is possible to predict the degree

of impact of a proposed development if certain information is available concerning existing lake chemistry and biology, limiting factors, and soil characteristics on the surrounding land. A Lake Classification utilizing this sort of information has been produced by the Thompson-Nicola Regional District, following a formulae used previously in the Prince George area and in Ontario. The T.N.R.D. puts the Roche-McGlashan area lakes in a "Natural Environment" category: restricting further subdivision or development to fishing camps (where appropriate) and basic public recreation facilities.

One important aspect of lake guidelines is that certain data are required about the system before decisions can be made concerning extent of development and required lake management options. Simple system disposal methods which are currently the standard mode for developments on lakeshores are questionable in their effectiveness at immobilizing wastes. Properly designed systems can be effective, but these must obviously be appraised on a site-specific basis. Further, it must be considered that overland runoff from any development can have as great an effect on water quality as sewage effluent. It is noteworthy that previous lake studies in this area indicate that the lakes are phosphorous-limited and would probably react quickly to any additions of this nutrient.

5.6 LAND FOR RESIDENTIAL AND COMMERCIAL DEVELOPMENT

The demands on both private and Crown lands for settlement uses are increasing, as a result of the growing population in Kamloops and its outlying areas. Improvements are being made in access to the region from major centers on the coast, which will bring additional demands for settlement opportunities, particularly in areas of significant recreation resources. The resource industry (mining) is expanding, and design and construction of the Coquihalla Highway is under way. The manner in which the private and commercial demands on land will be accommodated in the region while sufficient specific lands are protected for public use is a significant issue for the study area and its resources.

Local governments undertake the lead role in settlement planning in B.C. The Thompson-Nicola Regional District, through Letters Patent and Supplementary Letters Patent, has assumed 25 functions ranging from regional and community planning to street lighting. The Thompson-Nicola Regional District's general planning direction encourages commercial, small acreage rural, and recreational residential land uses to establish within existing communities or in areas specifically identified as having potential to accommodate development with minimum conflicts for the resource base and/or public use values.

The Thompson-Nicola Regional District utilizes a number of long-range plans and zoning to provide the guidance framework for land-use decisions in the Roche-McGlashan Study Area. While the Regional District's regulatory authority applies directly to privately held land, decisions on Crown land are carefully coordinated with its guidelines. The Regional District will ultimately assume the management responsibility for Crown lands allocated to settlement uses.

The variety and intensity of activities which accompany "private" ownership are highly consumptive of natural resources over a considerable surrounding area. There are many locations in the vicinity of Kamloops which offer urban, rural and lakefront recreational-residential opportunities. These are provided through subdivision of private holdings, or where Crown land has been made available for lease cabin-sites. Whereas there are potentially many marketable cabin/home sites in the Roche-McGlashan area, the values for public recreation are well recognized as the predominant concern. In its planning and regulatory responsibilities, the Regional District has identified the Roche-McGlashan area for resource-forest, and natural environment activities: to be generally preserved from further private land development. Existing settlement uses include Roche Lake Resort, which is currently undergoing conversion to a more intensive strata-type development, and two cabin sites on Crown leases on the opposite (west) shore. The resort is predominantly on private land

(there is a dock and an ice-house on leases). It has year-round access via a public highway, and is on the B.C. Hydro electrical distribution grid. The cabin-site leases represent conversion of a commercial fishing-camp tenure to a less intensive use upon expiry of the original.

5.7 MINERAL, PETROLEUM, NATURAL GAS, AND GEOTHERMAL RESOURCES

The rocks within the study area were partially surveyed in the late 1970's, in view of the concern for protecting recreation values in the upper Bleeker Creek watershed. The status of mineral claims has been reviewed more recently. Historically this area has been of little geological interest, and there are no current claims. In the upper Bleeker Creek watershed, the bedrock is a coarse grained granitic intrusive of Mid-Mesozoic age. The diorite and quartz-diorite is massive with well spaced joints and is relatively unaltered. The chances of discovering an economic mineral deposit in this part of the area are considered minimal, and the land might be better utilized for other resource purposes or for public recreation.

There are no current petroleum and natural gas leases or permits in the study area and the potential for hydrocarbon occurrences is insignificant. The potential for geothermal resources is largely unknown, as exploration for this resource is in its very early stages. The study area has not been investigated at all. The general Kamloops-Vernon-Kelowna region, however, may have low grade hot water sources suitable for local use and possibly warranting further investigation.